TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1900.

No. 139.

CLARENCE W. HOBBS AND GEORGE A. CRAIG AND ISAAC L. PROUTY, EXECUTORS OF RICHARD SUGDEN, DECEASED, PETITIONERS,

vs.

FRED H. BEACH.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE FIRST CIRCUIT.

PETITION FOR CERTIORARI FILED SEPTEMBER 20, 1900.
CERTIORARI AND RETURN FILED NOVEMBER 23, 1900.

(17,524.)

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a United States Circuit Court of Appeals for the First Circuit, October Term, 1897.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

CLARENCE W. HOBBS ET AL., Defendants, Appellants,
v.
FRED H. BEACH, Complainant, Appellee. } No. 247.

Appeals from the circuit court of the United States for the district of Massachusetts, from interlocutory decree (Putnam, J.), February 19, 1898.

Certified copy (in four volumes) of record and all proceedings in said cause, No. 246, Fred H. Beach, complainant, appellant, *v.* Clarence W. Hobbs *et al.*, defendants, appellees.

Volume I.

Pleadings and evidence.

Pages 1 to 364.

1 In the Circuit Court of the United States, District of Massachusetts. In Equity.

FRED H. BEACH
v.
CLARENCE W. HOBBS ET AL. } No. 2988.

Bill of Complaint.

Filed May 3, 1892.

To the honorable the judges of the circuit court of the United States in and for the district of Massachusetts, in chancery sitting:

Fred H. Beach, a citizen of the United States, residing in the city of Rochester, in the county of Monroe, in the State of New York, brings this his bill of complaint against Clarence W. Hobbs, and Richard Sugden, having a place, and doing business, as manufacturers of paper-box machinery, etc., under the title and style, "Hobbs Manufacturing Co.," in the city of Worcester, Massachusetts, and residents of said district.

And thereupon your orator complains and says: That prior to the 10th day of June, 1885, your orator was the true, original and first inventor of certain new and useful improvements in machines for attaching stays to the corners of boxes, not known or used by others in this country, and not patented, or described in any printed publication in this or any foreign country before his said invention or discovery thereof, and which had not, at the time of his application for a patent therefor, been in public use or on sale with his knowl-

edge or consent in any country for a period of two years; and therefore your orator, being the inventor of said improvements
2 and being a citizen of the United States aforesaid, did on the 10th day of June, 1885, make application to the proper department of the Government of the United States for letters patent therefor, in accordance with the then existing laws of Congress, and having duly complied in all respects with the conditions and exactions of said laws, such proceedings were had that on the 24th day of February, 1891, letters patent of the United States for said invention and improvements, under the seal of the Patent Office of the United States, signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, bearing date of the day and year last aforesaid, and numbered 447,225, were on said last-mentioned date issued in due form of law and delivered to your orator, whereby was granted and secured to your orator, his heirs, executors, administrators, or assigns, for the term of seventeen years from the day of the date thereof, the full and exclusive right of making, using, and vending to others to be used, the said improvement and invention, a description whereof is given in the words of the said inventor in a schedule in writing, accompanied by drawings, as by said original letters patent, or a duly authenticated copy thereof, in court to be produced, will more fully appear.

And your orator further shows unto your honors that said original letters patent No. 447,225, being found to be inoperative or invalid by reason of a defective or insufficient specification, and it being found that said defect or insufficiency had arisen through inadvertence, accident, or mistake and without any fraudulent or deceptive intention, were, before any intervening or adverse rights could or did accrue, to wit: on the ninth day of April, A. D. 1891, duly surrendered by your orator to the Commissioner of Patents and an application was duly made to the Commissioner of Patents on the aforesaid ninth day of April, A. D. 1891, for a new patent to be issued to your orator for the same invention on a corrected and amended specification; that said application was accompanied with such a corrected and amended specification and description and with the requisite drawings, and was conformable in all respects with the acts of Congress in such case made and provided; whereupon your orator having fully complied with all the requirements of said acts of Congress, such proceedings were had that on the 26th day of May, A. D. 1891, new letters patent for the same invention last mentioned, and numbered 11167, were duly granted, issued, and delivered to your orator, his heirs, assigns, and legal representatives for the residue of the aforesaid term of seventeen years; and that said new letters patent were issued in accordance with and in
3 due form of law, under the seal of the Patent Office of the United States, were signed by the Secretary of the Interior and by the Commissioner of Patents, and bear date of the day and year last aforesaid.

And your orator further shows that there was secured, by said reissued letters patent, to your orator and your orator's heirs, assigns and legal representatives, for the residue of said term of seven-

teen years from the twenty-fourth day of February, A. D. 1891, the full and exclusive right of making, using and vending to others to be used, said original improvement and invention; that a legal and corrected description and specification of said original improvement and invention contained in said reissued letters patent is given in the words of your orator, the inventor, in a certain schedule accompanied by drawings and written references thereto, which was in due form annexed to said reissued letters patent, at the time the same were issued and made a part thereof; as by said reissued letters patent or a duly authenticated copy thereof, in court to be produced, will more fully appear.

And your orator shows unto your honors that he is the sole and exclusive owner of said invention and reissued letters patent and of all rights and privileges thereunder; that said invention is of great value and utility; that he has made said invention profitable to himself and the public by making and selling large numbers of machines embodying the invention as aforesaid; that the public and the trade and users generally have acknowledged the value of the said invention and have acquiesced generally in the validity and legality of said reissued letters patent and of your orator's exclusive rights and privileges thereunder; and that being so engaged in the manufacture of said machines, he has ample facilities for supplying all the demands of the public and of the trade for said invention.

Your orator further complains and says that the defendants, well knowing the facts, as hereinbefore set forth, but contriving to injure your orator and deprive him of the benefits and advantages which might and otherwise would accrue to him from said invention and said reissued letters patent, and conspiring and confederating together with divers persons to your orator at this time unknown, to injure your orator and your orator's business, have made or caused to be made, sold or caused to be sold, used or caused to be used, in

4 the city of Worcester, in the State of Massachusetts, and, as your orator believes, elsewhere within the United States and Territories thereof, without your orator's license and permission and against the will of your orator, and in violation of his rights, large numbers, but how many your orator is not informed, of machines for attaching stays to the corners of boxes, made, constructed and arranged and containing the invention substantially as set forth, described and claimed in said reissued letters patent, and to the great damage and injury of your orator; and your orator is informed that the said defendants or their agents or confederates, or both, have made and realized large gains and profits from their unlawful manufacture, sale or use of the said invention so secured exclusively to your orator, as aforesaid; but your orator does not know the amount of such manufacture or sales nor the extent of such use or uses, nor of such gains and profits, and therefore prays that the said defendants may be required to make full disclosure to this honorable court.

Your orator further avers that the defendants, though requested, refuses to desist from infringing your orator's said letters patent, and refuses to account for and pay over to your orator the gains and

profits so unlawfully made by them as aforesaid; and that your orator is informed and believes it to be true, that the said defendants and their agents and confederates have on hand large numbers of machines for attaching stays to the corners of boxes, embodying all the substantial features of the said invention, so secured exclusively to your orator, manufactured or partially so, at their shops in Worcester, Massachusetts, and elsewhere in said district, ready for sale and use, and which they intend and threaten to sell, give away, or otherwise put into use, without your orator's permission and license, and to the great and irreparable loss and injury of your orator herein.

All of which actings and doings of the said defendants are contrary to equity and good conscience, and tend to the manifest wrong and injury of your orator in the premises.

In consideration whereof, and forasmuch as your orator can have no adequate relief, only in this honorable court, where matters and doings of this sort are cognizable and relievable, to the end, therefore, that the said defendants may, if they can show why your orator should not have the relief hereby prayed, and may, according to the best and utmost of their knowledge, remembrance, information and belief, but not under oath (answer under oath being expressly waived), full, true, direct and perfect answer make to all and singular, the matters and things stated and charged; that they may be decreed to account for and pay over to your orator all gains and profits realized by them directly or indirectly, from the making, using, and vending the improvement vested in your orator, as aforesaid, and to pay your orator for all damages and losses caused to your orator by the said unlawful acts of said defendants; and may be compelled to desist the further infringing of your orator's said letters patent.

Wherefore your orator prays:

1. That the defendants may answer the premises.

2. That the defendants may be decreed to account and pay over to your orator such gains, profits and damages as this honorable court shall direct.

3. That the defendants may be compelled to pay the costs of this suit.

4. That the defendants may be enjoined during the pendency of this suit from such infringement.

5. That the defendants may be perpetually enjoined from such infringement.

6. That the defendants may be compelled to destroy, under the direction of this honorable court, or to deliver to your orator for that purpose, all machines for attaching stays to the corners of boxes, or parts of machines now in his possession or in the possession of their agents, attorneys, servants or workmen, made in accordance with or containing said invention aforesaid.

May it please your honors to grant unto your orator the restraining writ of injunction of this court, provisionally enjoining and restraining said defendants, Clarence W. Hobbs and Richard Sugden and their clerks, attorneys, agents, servants and workmen from

making, using and vending any machines for attaching stays to the corners of boxes, or parts thereof, embodying said patented improvements during the pendency of this suit; and also the writ of injunction of this court perpetually enjoining and restraining said defendants, Clarence W. Hobbs and Richard Sugden, and their clerks, attorneys, agents, servants and workmen from making and using and vending any machines for attaching stays to the corners of boxes, or parts thereof, embodying said patented improvements; and that your orator may have such other or further relief as the nature of the case may require and to your honors may seem meet.

6 May it please your honors to grant unto your orator not only the writ of injunction conformable to the prayer of this bill, but also a writ of subpœna, directed to said defendants, Clarence W. Hobbs and Richard Sugden, and each of them, commanding them on a day certain therein to be named, to be and appear in this court, then and there to answer the premises and to stand to, perform and abide by such further order, direction and decree as may be made against said defendants.

And your orator, as in duty bound, will ever pray, etc.

FRED. H. BEACH,
By JOHN DANE, JR.,
His Solicitor.

JOHN DANE. JR.,
Sol. & of Counsel.

UNITED STATES OF AMERICA, } ss:
State of New York, County of Monroe, }

Fred H. Beach, being first duly sworn, deposes and says that he is the complainant named in the foregoing bill of complaint; that he has read said bill and knows the contents thereof, and that the allegations thereof are true to his own knowledge, except as to those matters therein stated on information and belief and as to such matters he believes them to be true.

FRED H. BEACH.

Subscribed and sworn to before me this 25th day of April, A. D. 1892.

[SEAL.] HERBERT F. ANDREWS,
Notary Public.

Amendment to Bill of Complaint.

(Filed July 13, 1892.)

To the honorable the judges of the circuit court of the United States in and for the district of Massachusetts:

In the suit in equity, Fred H. Beach *v.* Clarence W. Hobbs *et al.*, No. 2988—

After answer filed and before replication, the complainant respect-

fully petition- that he be allowed to amend his bill by erasing
7 the third section on page 1 of said complaint, beginning with the words "and thereupon" and ending with the words "laws of" at the bottom of the page, inserting in lieu thereof the following: "And thereupon your orator complains and says: That prior to the 10th day of June, 1885, your orator was the true, original and first inventor of certain new and useful improvements in machines for attaching stays to the corners of boxes, not known or used by others before his invention or discovery thereof, and not patented or described in any printed publication either in this or any foreign country before his said invention or discovery of the said machine so patented, and which had not, at the time of his application for a patent therefor, been in public use or on sale for a period of two years prior to said application; and therefore your orator, being the inventor of said improvements and being a citizen of the United States aforesaid, did on the 10th day of June, 1885, make application to the proper department of the Government of the United States for letters patent therefor, in accordance with the then existing laws of."

Dated July 12th, 1892.

FRED H. BEACH,
By JOHN DANE, JR.,
Solicitor of Record for Complainant.

Filed by consent.

Answer.

(Filed June 29, 1892.)

The answer of Clarence W. Hobbs and Richard Sugden to the bill of complaint of Fred H. Beach.

These defendants now and at all times hereafter saving and reserving unto themselves all manner of benefit and advantage of exception that can or may be had or taken to the many errors, insufficiencies and imperfections in said bill of complaint contained, for answer thereto or to so much thereof as they are advised it is material or necessary for them to make answer unto, answering say:

They admit the grant of letters patent No. 447,225, in the bill mentioned.

They admit the surrender of said letters patent No. 447,225, and the grant of reissued letters patent No. 11167.

8 They deny that said letters patent No. 447,225, were inoperative or invalid by reason of a defective or insufficient specification; and they also deny that any defect or insufficiency in said letters patent No. 447,225, arose through inadvertence, accident or mistake.

They aver that the combination of opposing clamping dies, feeding mechanism, and pasting mechanism was well known before the alleged invention of said Beach; and they also aver that the combination of opposing clamping dies, feeding mechanism and severing mechanism was well known before the alleged invention of said

Beach; and they also aver that the combination of opposing clamping discs, feeding mechanism, pasting mechanism, and severing mechanism was well known before the alleged invention of said Beach; and they also aver that opposing clamping dies having diverging working faces and constructed for use as clamping dies for box corners were well known before the alleged invention of said Beach; and they further aver that it is not — intention or discovery to substitute opposing clamping dies of one known form for opposing clamping dies of another form in either of said combinations; wherefore they aver that the first, the second and the third claims of said reissued letters patent, No. 11167 are all and singular void.

Further answering they aver that machines which fed strips between clamping dies, pasted the strips, severed the desired portion, and clamped the severed pasted portion upon the article it was attached to, were well known before the alleged invention of said Beach; and that clamping dies for use with box corners were also well known before the alleged invention of said Beach; and that the alleged invention or discovery described in said reissued letters patent No. 11167 and referred to in the first, second and third claims thereof is not an invention or discovery, but it is the mere substitution of one well-known form of clamping dies for another well-known form of clamping dies, not involving invention or discovery; wherefore they aver that the first, the second and the third claims of said reissued letters patent No. 11167, are all and singular void.

Further answering, they deny that said Beach was the original and first inventor or discoverer of any material and substantial part of the thing patented by said letters patent No. 11167, and referred to in the first, second or third claims thereof, and give
9 notice that they will rely upon the following letters patent of the United States as prior patents, and also as printed publications, namely:

No. 19270, dated February 2d, 1858, to Elisha Waters.

Reissue, No. 1212, dated July 9th, 1861, to Elisha Waters.

No. 148,416, dated March 10th, 1874, to Joseph Cohn.

No. 166,940, dated August 24th, 1875, to Charles E. Sawyer.

Further answering, they deny that they have in any way contrived to injure the complainant, and deny all conspiracy and confederacy in the bill alleged; and they also deny that they singly or as associates in business have ever made, or used, or sold, or had any concern whatever with making, using or selling of machines containing the invention or any material and substantial part of the invention claimed in said reissued letters patent, No. 11167; but they admit that they have made, used and sold, and are now making, using and selling the machines described in letters patent of the United States, No. 442,582, dated December 9th, 1890, and aver that they have full right so to do; and they further aver that the combination of clamping dies for box corners with a feed, paster and cutter, as described in said patent, No. 442,582, is a new combination of those elements, and is substantially different from any combination described in said reissue, No. 11,167.

Further answer-, they aver that no invention or discovery is described or shown in the specification and drawings of said letters patent, reissue No. 11167, so far as they relate to the first, second and third claims thereof; and they also aver that each and all of the elements of the several combinations claimed in said first, second and third claims are old; and they give notice that they will rely upon said letters patent, reissue No. 11167, as conclusive proof against the complainant that each and all of these elements are old; and also as conclusive proof that other forms of clamping dies than that form suited to box corners are old in combination with a feed, a paster and a cutter; and will insist that the first, second and third claims of said letters patent, reissue No. 11167, are void on the face of the patent, and without proof, precisely as if they had demurred to the bill of complaint; and they do not, by filing this answer, waive this defense, it being impossible to take this defense by demurrer, because of the other claims in said patent, No. 11167, and because of the general allegations in the bill as to validity and infringement of all the claims.

Further answering, they aver that the thing patented in said letters patent, reissue No. 11167, was in public use and was on sale for more than two years prior to the application for original letters patent, No. 447,225; and they give notice that there is no allegation in the bill of complaint that said alleged invention was not in public use or on sale for more than two years before the application for letters patent, No. 447,225, and that they do not by filing this answer waive this fatal defect in said bill of complaint—namely, the lack of any allegation as to this statutory requirement; but that they will insist that no decree for complainant can be based on said bill of complaint, because of the lack of this allegation precisely in all respects as if they had taken this defense by demurrer, before filing this answer.

Further answering, they deny that the complainant is entitled to any part of the relief prayed because:

First. The bill contains no allegation that the alleged invention was not in public use or on sale for more than two years prior to said Beach's application for said letters patent, No. 447,225; consequently, no proof is admissible as to that fact, and no decree for complainant can be based upon the bill.

Secondly. The bill and the patents referred to in it estop the complainant from denying that each and all of the elements claimed in combination are old; and also estop the complainant from deny- that the alleged invention of the first, second and third claims of reissued letters patent No. 11167 is the mere substitution of one old form of clamping dies for another old form of clamping dies; which is mere double use, and not invention or discovery.

Thirdly. The combination of clamping dies with a feed, a paster and a cutter is not new with the patentee of reissued letters patent No. 11167, and specific clamping dies described and shown in the drawings of reissued letters patent No. 11167, are not new with that patentee; and there is no invention or discovery involved in sub-

stituting these specific clamping dies, for other clamping dies, in that combination.

Fourthly. Defendants have not made, used or sold any combination substantially the same as either of the combinations described in reissued letters patent No. 11167, and referred to in the first, second and third claims thereof; and have not made, used or sold any combinations substantially the same as either of those referred to in the other claims of reissue letters patent No. 11167.

11 Wherefore these defendants pray the same benefit as to all matters in said bill contained as if they had demurred thereto, where a demurrer would have been proper, and submit that said complainant has no right to any further answer to said bill or any part thereof, and no right to any injunction, account, assessment of damages or other relief; without this, that any other matter or thing in said bill contained, and not herein and hereby fully answered unto, confessed and avoided, traversed or denied is true; all which these defendants will aver, maintain and prove as this honorable court shall direct.

Wherefore they pray to be hence dismissed with their reasonable costs and charges in this behalf most wrongfully sustained.

By their solicitors, MAYNADIER & BEACH.

J. E. MAYNADIER, *Of Counsel.*

Amendment to Answer.

(Filed December 1, 1892.)

Now come the defendants and amend their answer heretofore filed herein, as follows:

1. By inserting at end of line 12, page 2 thereof:

Farther answering, these defendants aver, upon information and belief, that said F. H. Beach was not the original and first inventor or discoverer of any material or substantial part of the thing patented; but the same, and material and substantial parts thereof, were, prior to said Beach's supposed invention or discovery known to and used by the following-named persons at the following-named places, viz:

J. T. Ferris, of Anderson, Indiana, at Richford, Vermont, and divers other places in the United States.

John C. Metcalf, of Lynn, Massachusetts, at Lynn, Mass., and divers other places in the United States.

A. G. Potter, of said Lynn, at said Lynn, and divers other places in the United States.

Charles E. Sawyer, of Boston, Mass., at Boston, Mass.

Clarence W. Hobbs, of Worcester, Mass., at Lynn, Mass., and divers other places in the United States.

By their solicitors, MAYNADIER & BEACH.

Filed by consent.

12 *Replication.*

(Filed July 29, 1892.)

The replication of Fred. H. Beach, complainant, to the answer of Clarence W. Hobbs *et al.*, defendants.

This repliant, saving and reserving unto himself all and all manner of advantage of exception to the manifold insufficiencies of the said answer for replication thereunto, says that he will ever aver and prove his said bill to be true, certain and sufficient to be replied unto by this repliant; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto, confessed and avoided, traversed or denied, is true. All which matters and things this repliant is and will be ready to aver and prove as this honorable court shall direct, and humbly pray as in and by the said bill it has already prayed.

Dated New York, July 28th, 1892.

JOHN DANE, JR.,
Solicitor for Complainant.

Stipulation.

It is hereby stipulated by and between counsel for the respective parties to the above-entitled cause, that complainant may have to and including the 15th day of October, 1892, within which to take and close his *prima facie* proofs, and that defendants may have to and including the 15th day of November, 1892, within which to take and close their proofs, and that complainant may have to and including the fourth day of December within which to take his proofs in reply. It is also stipulated that both parties hereto may offer and put in evidence printed copies of any patent, and that the same may be used and be considered the same as if duly certified by the Commissioner of Patents, subject, however, to such changes as might be required to make them conform to the original of which they purport to be a copy.

Dated New York, September 15th, 1892.

JOHN DANE, JR.,
Solicitor for Complainant.
MAYNADIER & BEACH,
Solicitors for Defendants.

13 *Stipulation.*

In order to save time and expense to litigants in this case, it is stipulated that defendants' counsel will produce one of the alleged infringing machines, made by defendants, before the examiner or to plaintiff's counsel, at, or before the first session held for the examination of witnesses, or other proceedings, by defendants paying the proper freight or express charges, and that it will be admitted

that defendants have at least one of such, before the commencement of this suit.

Dated New York, September 15th, 1892.

JOHN DANE, JR.,
Complainant's Solicitor.
MAYNADIER & BEACH,
Defendants' Solicitors.

Evidence for Complainant.

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, John A. Shields, United States commissioner and examiner.

NEW YORK, *October* 11, 1892—12 o'clock noon.

Met pursuant to the following notice:

"Circuit Court of the United States for the District of Massachusetts.
In Equity.

FRED H. BEACH, Complainant,
v.
THE HOBBS MFG. CO. ET AL., Defendants.

Notice is hereby given, that we shall proceed to take proofs for final hearing on the part of the complainant under the 67th rule of the Supreme Court for courts in equity, as amended, or in accordance with the statutes in such case made and provided, and
14 in pursuance of the rules and practice of this court, before an examiner of this court or other proper officer, under said statutes and rules, at the offices of John Dane, Jr., 261 Broadway, on the eleventh (11th) day of October, 1892, at 12 o'clock in the forenoon.

The names and residences of the witnesses who live at a greater distance from the place of trial than one hundred miles, whom it is intended to examine, are stated below.

You are invited to attend and cross-examine any witnesses produced. The examination will be adjourned from day to day, and to such time and place as may be required without further notice.

Dated New York city, October 6th, 1892.

JOHN DANE, JR.,
Solicitor, 261 Broadway, New York.

To Maynadier & Beach, defendants' solicitors."

Name of witness.	Residence.
Henry L. Brevoort	Brooklyn, N. Y.

Present: John Dane, Jr., Esq., for complainant; no appearance for defendants.

At the request of Mr. Dane the proceedings herein are suspended for the convenience of defendants' counsel, and a recess taken until 3 o'clock p. m.

At 3 o'clock p. m., met pursuant to adjournment.

Whereupon Mr. Dane for complainant proceeded by putting in evidence a printed copy of reissued letters patent of the United States granted to Fred H. Beach, No. 11167, dated May 26th, 1891, entitled "Machine for attaching stays to corner of boxes," which copy, by consent of both parties, as well as such others as may be offered is, and are, to be admitted in evidence in this case, accepted, treated, used and referred to, as though duly certified by the Commissioner of Patents.

Complainant's counsel also puts in evidence a machine made by defendants, which is admitted by defendants' counsel to be the same in all material respects as the machine complained of as infringement of complainant's patent No. 11167. The machine referred to is put in evidence, and marked by tag "Complainant's Exhibit Defendants' Infringing Machine, J. A. S., examiner."

It is also admitted that the respondents have made and sold one or more machines like the said exhibit, since the issue of said patent, and before the commencement of this suit.

15 *Deposition of Henry L. Brevoort.*

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. My name is Henry L. Brevoort. I am 43 years of age. I live in Brooklyn, N. Y., and I am a mechanical engineer.

Int. 2. What experience, if any, have you had which qualifies you to testify as an expert in matters wherein machinery is the subject of consideration, or litigation?

Ans. I learned the trade of a machinist when I was a boy, and after that I was engaged in the practical building and designing of machinery. For the last twenty years I have been almost exclusively engaged in examining patents and patented inventions, and during this time I have been very frequently called upon to testify as an expert mechanic in suits relating to patents. I have been called upon to testify in upwards of 500 suits, some being in the State courts, but the majority in the circuit courts of the United States. I am familiar with various box-making machines.

(Adjourned to 11.30 o'clock, Friday morning, October 14, 1892.)

NEW YORK, *October* 14, 1892—11.30 a. m.

Met pursuant to adjournment.

Present: John Dane, Jr., Esq., for complainant.

Notice from Maynadier & Beach, solicitors for defendants, was read suggesting that the examination proceed, with the request for leave to cross-examine in case they should so desire.

The suggestion is accepted, and the request granted.

Whereupon the examination of Mr. BREVOORT is continued as follows:

Int. 3. Have you read and examined United States letters patent granted to Fred. H. Beach, reissue No. 11167, dated May 26, 1891?

Ans. I have read and very carefully examined the patent referred to in the question, and I understand what is therein shown, described and claimed.

Int. 4. Please state what you understand to be the invention set forth in the Beach patent above referred to, and especially pointed out in the first, second, third and sixth claims thereof?

Ans. The Beach reissue, No. 11167, describes a machine for attaching stay strips, or strengthening pieces, to the corners of
16 boxes made of paste or strawboard. Such stay strips have heretofore been applied usually by hand as the patent informs me, and this operation is somewhat tedious and expensive. The Beach reissue describes a machine for doing this work rapidly and quickly by mechanical devices, thus obviating the slower hand process. The machine consists of an anvil or lower die, having at the upper portion two working faces, which diverge downward from one another at a right angle. Working in connection with this anvil or die, and above it, is a vertically movable die or plunger, having also two diverging working faces, the working faces of the plunger forming a notch therein, which notch co-operates with the upper portion of the lower anvil or die, the dies being adapted to operate upon the right-angle corner of a box to compress the said corner between the working faces of the opposing dies. A strip of paper suitable for the stay is fed by automatically moved mechanism over a pasting device, and between a pair of shears, and thence between the upper and lower die when separated. The operation of the machine briefly described is as follows: A box whose corner is to be strengthened by the addition of a stay strip is placed upon the lower anvil or die, the inside of the corner of the box resting upon the apex of the lower die. The machine as it is revolved then feeds forward the stay strip which has the paste upon it, and as the upper die descends the shears also operate, severing from the continuous stay strip a portion sufficient for the stay. As the cutting operation is completed the upper die or plunger is descending, and forces the gummed stay strip into position upon the outside of the box corner, and the stay strip and box corner are pressed between the working faces of the two opposing dies, and thus the stay strip is caused to conform to, and be stuck upon, the corner of the box. When the upper die or plunger rises, the box with its attached stay strip can be removed and another corner presented, when the operation will be repeated. The upper die or plunger is provided with a spring of rubber or metal, so that it may yield slightly in the direction of its motion, so that it may give an elastic pressure upon the box, and also be made to operate upon different thicknesses of box or stay strips.

Briefly, this description describes the machine, so far as it is necessary to describe the same for the purposes of this case. I must state,

however, that the machine is also arranged to fold in the end of the stay strip within and into the interior of the box, and this it accomplishes by having the lower die longitudinally movable, and
17 by supporting the box upon both the working faces of the lower die and upon the faces of the block within which the lower die can move. The faces of the upper portion of the die and of the block are arranged so that they form two planes at right angles to one another, the planes of the upper working faces of the die corresponding with the planes of the upper faces of the block. I refer to this capacity of the machine merely for the purpose of showing that I have considered the same, but such capacity, that is, the ability to turn the end of the stay strip in, and over, the edge of the box, is not a feature of the machine which need always be present. I quote as follows from the specification of the patent:

"In many boxes the stay is simply pasted against the exterior surface of the box corner, and is not turned in or over the edge of the same, in which case the work can be done by using a non-reciprocating angular lower die or anvil and a single upper die or plunger. In such case the form B will obviously not be necessary as a part separate from the die; or, in other words, a single lower die or form will take the place of the form B and movable lower die I."

From the above quotation it will be clearly evident that the patentee contemplated using his machine in the simple form in which I have described it, and divested of that mechanism which is involved when the stay strip is turned over the edge of the box and into the same. As the issue in this case involves a mechanism which does not turn the stray strip over and into the box, I have deemed it best not to put upon the record a description of the mechanism for accomplishing that result.

The upper die or plunger is shown in the drawings of the reissue and is indicated by the letter G, the lower die is indicated in the drawings by the letter I. The strip of material to form the stay strip is shown rolled up at K, and this strip is conducted over the periphery of the roll O, which gets paste from the trough J. At Q are shown the shears for cutting the strips into lengths, and at G^2 is shown the spring which enables the upper plunger or die to give a yielding pressure upon the box corner and stay strip. The die I, as stated in the quotation above made, is not movable, when stay strips are merely to be pasted upon the outside of the box corner, and the block B can then be dispensed with, the motions and parts only being utilized when the stay strip is to be turned into the box. The same statement is also true of the supplemental plunger H.

18 Turning to the claims to which the question directs me I find that the first claim is for a combination of parts, the parts being as follows:

First. Two opposing clamping dies having diverging working faces.

Second. A feeding mechanism which delivers the stay strip between the clamping dies when the upper die is raised, and;

Third. A pasting mechanism.

The clamping dies are to be so arranged as to co-operate with one another and to press a stay strip upon a corner of a box when the said box is placed between the dies. Thus it is not every set of dies or every feeding mechanism, or every pasting mechanism which the claim includes, but it does include such devices only when adapted for the performance of the operation described in the patent. To save repetition I will say that this statement is true of all the claims under consideration.

The second claim is also for a combination. The combination including the dies, the feeding mechanism and the cutter for cutting from the continuous stay strip a piece sufficient for each box corner.

The third claim includes the same dies, the feeding mechanism, the pasting mechanism and the cutter, or shears.

The sixth claim includes the same two opposing clamping dies, having the diverging working faces, and with a spring in one of the dies to enable the die to act with an elastic or yielding pressure, so that boxes of different thicknesses may be operated upon.

Int. 5. Have you examined and do you understand the mode of operation of the machine which is now shown you, marked "Defendants' Exhibit Infringing Machine, J. A. S., examiner," and if yea, please state whether in your judgment, the said machine contains the invention specified in the said first, second, third and sixth claims of the Beach patent, and give any reasons you may have for such conclusions as you may reach?

Ans. I have examined and I understand the mode of operation of the machine marked "Defendants' Exhibit Infringing Machine," and I think that this machine contains the invention specified in the first, second, third and sixth claims of the Beach patent, to wit: reissue No. 11167.

I will give my reasons for this opinion.

The defendants' machine is made for the purpose of applying stay strips on the corner of boxes and is thus just like the
19 machine of the patent in suit. The machine consists of a suitable stand provided with a lower anvil or die, the working faces of which diverge and form a right angle upon which working faces of box can be placed and supported. Above this is a vertically moving die having a notch in it, the working faces of which form a right angle and correspond with the faces of the lower die, so that the two dies can co operate in the pressing of stay strips upon a box corner. I have ascertained that the upper die is provided with a spring so that its pressure is a spring or yielding pressure, thus adapting it to act in connection with the lower die upon boxes of different thicknesses.

There is a reel attached to the framing of the machine for carrying the continuous stay strip, also a pasting mechanism consisting of a roller in a trough, for supplying paste to the stay strip, a feeding mechanism for advancing the stay strip the proper distance at each revolution of the machine, and a shear or cutter for cutting off the stay strip when it is fed in between the opposing clamping dies.

In the case of the defendants' machine the movable blade of the shear of the cutting mechanism consists of the inner edge of the upper clamping die operating in connection with a portion of the frame of the apparatus. As the defendants' machine is only intended to apply stay strips to the exterior of a box, all the mechanism shown in the patent which specifically relates to the turning in of the stay strip within the box is absent, and consequently the lower die in the defendants' machine is made movable only for the purpose of adjustment, and it is not moved when the machine is in operation, thus conforming to the statement in the patent as to the condition of the patented machine when the same is used only for the purpose of applying stay strips to the exterior of the box corner. In the patent under consideration the stay strip is fed at right angles to the line forming the corner of the box, while in the defendants' machine the stay strip is fed parallel to the said box corner, likewise the feeding mechanism of the defendants' machine differs from the patented machine somewhat, but they are both alike in that they grasp the paper and project it forward over the corner of the box when the dies are open. These differences I do not think are material as they in nowise alter the main features of the machine. The patent recognizes the fact that such differences may exist, and I quote the following from the specification:

"As far as the main features of my invention are concerned, forms other than those illustrated of the several parts of the machine may be employed without departure from my invention—as, for instance, in place of the particular mechanisms shown for feeding or delivering fastening strips or stay strips to and between the clamping dies, or for applying paste or glue to the said stay strips—other forms of strip feeding and pasting devices may be used in practice with the same general result, as above described."

The above will clearly indicate that the patentee himself recognizes the fact that his invention could be found though many of the details of the mechanisms were altered somewhat from the form adopted by him to illustrate his invention.

Turning now to the claims it will be seen that the defendants' machine contains two opposing clamping dies, having diverging working faces which are clearly the equivalent of the dies of the patent, the upper dies being movable. The defendants' machine has a feeding mechanism which delivers the stay strip between the clamping dies when apart, and a pasting mechanism to apply paste to the stay's strip. The clamping dies are arranged so that they co-operate in pressing the stay strip upon the interposed box corner. The lower clamping die is to be within the box corner and the upper clamping die is to press the stay strip upon the exterior of the box corner. This is the combination of the first claim and it is found in the defendants' machine.

The second claim involves the same dies and the same feeding mechanism, but for the pasting mechanism of the first claim the second claim substitutes the cutting mechanism for severing the stay

strips into suitable length. This combination the defendants' machine contains.

The third claim involves four elements, to wit: The opposing clamping dies, the feeding mechanism, the pasting mechanism, and the cutting mechanism. All these parts are found combined in the same way in the defendants' machine.

Turning now to the sixth claim I find in the defendants' machine two opposing clamping dies having diverging working faces the upper one of which is constructed to act with an elastic or yield, ing pressure to enable the die to operate upon box corners of different thicknesses. This is the combination referred to in the sixth claim, and it is found in the defendants' machine.

In my opinion the defendants' machine clearly contains the combination of the first, second, third and sixth claims of reissue No. 11167, the combinations being the same combinations, the combined parts being substantially the same parts, operating in
21 the same way for the production of the same result, and constituting in all respects the combinations specified in the four claims before referred to of reissue No. 11167. I have noted the differences which exist between the machines, and I may add that these differences do not, in my judgment, constitute any substantial or material dissimilarity, and I do not feel it necessary to further refer to them, as they are not of importance when considered in connection with the combination of the claims under consideration.

The description of the reissue in suit clearly points out the work to be performed by the parts which are combined in the various claims. In the defendants' machine this identical work is to be performed and the same parts are present for the performing of the same operations. That the parts differ in their mechanical details is not of importance, for the like parts are present in both machines and they perform like duties and functions.

HENRY L. BREVOORT.

Cross-examination by JAMES E. MAYNADIER, Esq., of counsel for defendants:

Cross-int. 6. Assume that the combination of two opposing clamping dies, with flat faces, a feeding mechanism which delivers the stay strip between the clamping dies when the upper die is raised and a pasting mechanism, is not new with the patentee of the patent in suit;

Also that the combination of two opposing clamping dies with flat faces, a feeding mechanism, and a cutter or shears, is not new with the patentee of the patent in suit;

Also that the combination of the same dies, the feeding mechanism, the pasting mechanism and the cutter or shears, is not new with the patentee of the patent in suit;

Also that the two opposing clamping dies having diverging working faces described by you are not new with the patentee of the patent in suit;

On these assumptions do you think there is any invention or

discovery in the combinations described in the patent in suit and referred to in the first, second, third and sixth claims?

If so state fully what you think that invention or discovery is.

Ans. Under the assumptions of the question there might or there might not be invention in the claims of the patent in suit. This question would turn upon the devices which in cross-question 6 are assumed to exist. If the opposing clamping dies, the feeding
22 mechanism, the pasting mechanism and the cutter or shear are the equivalents of those of the patent and are combined to produce the same result, then, it would seem to me that the claims under consideration would properly disclose no new invention over and above that which might be found in the claim involving the elastic or yielding upper die. It may be, however, that the mechanism assumed in the question, though having parts of such a nature that the words used in the question could be said to be descriptive thereof, is, in fact, a mechanism which is not equivalent either as a whole or in part for the mechanism of the patent in suit, and, under such a condition of affairs, the inventions of the claims in controversy would consist in the combinations to which I have referred. No more definite answer can be given to the question until the assumed mechanism are brought to my notice in some more definite way than by mere words; because, the words that might be descriptive of a certain piece of mechanism to one man might be wholly inappropriate as descriptive of that mechanism to another man's mind; therefore, a definite answer to the question without seeing the mechanism is impossible.

Cross-int. 7. Are any of the assumptions of the preceding question justified so far as you know by the state of the art? And give the number and date of any patent, and of all patents, and a reference to any and all printed publications showing either of the things assumed in the preceding question, prior to the 10th day of June, 1885; so far as you know such numbers or dates of reference?

Ans. I do not know whether the assumptions of question 6 are justifiable or not. I have made no examination into the state of the art. The only devices said to be earlier than the patent in suit which I saw were some drawings in an interference record, I believe; which drawings purported to represent what I understood to be a machine built or designed by one Inman. I have no personal knowledge in the matter at all beyond the fact that I saw certain drawings. I may be wholly in error as to dates and the origin of the machine represented by the drawings.

Such drawings did not show a machine containing the combinations of the machine in controversy.

HENRY L. BREVOORT.

23 Circuit Court of the United States for the District of Massachusetts. In Equity.

FRED H. BEACH, Complainant,
v.
THE HOBBS MFG. CO. ET AL., Defendants.

Notice is hereby given, that we shall proceed to take proofs for final hearing on the part of the defendants under the 67th rule of the Supreme Court for courts in equity, as amended, or in accordance with the statutes in such case made and provided, and in pursuance of the rules and practice of this court, before an examiner of this court, or other proper officer, under said statutes and rules, at the office of Edward S. Beach, No. 27 School St., on the 8th day of December, 1892, at 10 o'clock in the forenoon.

The names and residences of the witnesses who live at a greater distance from the place of trial than one hundred miles, whom it is intended to examine, are stated below.

You are invited to attend and cross-examine any witnesses produced. The examination will be adjourned from day to day, and to such time and place as may be required without further notice.

Dated Boston, Mass., Nov. 28th, 1892.

THE HOBBS MFG. CO. ET AL.,
By their solicitor, EDWARD S. BEACH.

To John Dane, Jr., Esq., complainant's solicitor.

Stipulation.

It is hereby agreed between the counsel for respective parties that the times heretofore set for taking evidence in defense, and the evidence in reply be extended for ten days. Counsel for defendants gives notice that he will begin to take his evidence in defense on Thursday, December 15th, 1892, at 11 o'clock a. m., rooms 62–64, No. 27 School street, Boston, Mass.

Dated December 3d, 1892.

EDWARD S. BEACH,
Counsel for Defendants.
JOHN DANE, JR.,
Counsel for Complainant.

24 *Evidence for Defendants.*

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Warren K. Blodgett, Jr., special examiner, by consent of parties.

BOSTON, *Dec.* 15, 1892.

Present: John Dane, Jr., Esq., of counsel for complainant; Edward S. Beach, Esq., of counsel for defendant-.

Parties meet, pursuant to notice and agreement.

It is agreed by and between counsel for the respective parties that

Warren K. Blodgett, Jr., of Boston, a notary public, act as special examiner for the taking of the evidence in defense in this suit.

Deposition of Albert G. Potter.

Direct examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence and occupation?

Ans. Albert G. Potter, Swampscott, box manufacturer; age, 41.

Int. 2. How long have you been engaged in business as a box manufacturer?

Ans. I have been connected with the box business since 1869. For myself, since December, 1883. Wood and paper boxes, both.

Int. 3. Please look at this machine and state what it is, if you know?

Ans. It is a Glazier box press.

Int. 4. Have you ever been connected with the manufacture or sale of machines like this?

Ans. Yes, sir, I have.

(Counsel for defendants now offers in evidence the machine to which the witness has referred, and the same is marked, "Defendants' Exhibit Glazier Box Press, W. K. B., Jr., sp'l ex'r.")

Int. 5. Please give the history of these Glazier box presses so far as you are acquainted with it.

Ans. The original machine was invented by my father, Benjamin Potter, somewhere about 1869, and was used in his business up to about 1882, when it was made over in connection with G. W. Glazier, into the present style of machine.

Int. 6. What was the construction of the original machine?

Ans. The original machine was made with a solid frame, so that when you stepped on the treadle the box moved up against the top plate, right the reverse from this one, which drops down onto the box.

Int. 7. Whether or not that original machine had a clamping die which was constructed to act with an elastic or moving pressure?

Ans. The original machine had a piece of rubber the size of the box form between the box form and the horn.

Int. 8. What was the function of that piece of rubber between the box form and the horn?

Ans. It was to relieve the pressure, so that the various thicknesses of strawboard would not break the machine.

Int. 9. How many clamping dies were there on that original machine?

Ans. Two members—the box form and the plate.

Int. 10. What do you mean by saying that it was made over in connection with G. W. Glazier? Explain fully.

Ans. I mean that the patents were made over so to get a new-

style machine, but the principle was just the same, with the exception of the rising of the box, and the rubber was placed on the rod of the Glazier machine above the plate; whereas on the old machine it was between the box form and the horn.

Int. 11. What did Glazier have to do with it?

Ans. Glazier was the machinist and did the work.

Int. 12. For whom did he work?

Ans. He worked for Benjamin Potter. He built the first machine of the style called the Glazier machine.

Int. 13. For whom did he build the first Glazier machine?

Ans. Benjamin Potter.

Int. 14. Will you please explain your connection with Benjamin Potter, with Glazier, and this Exhibit Glazier Machine?

Ans. I worked for my father previous to '83; then I bought out the box business; then I had connection with Glazier in regard to these machines.

Int. 15. Does Defendants' Exhibit Glazier Box Press contain the combination of opposing clamps, one of which is constructed to act with an elastic or yielding pressure?

(Question objected to as leading or improper.)

Ans. Yes, it does.

26 Int. 16. How long have these Exhibit Glazier Box Presses been on the market—if they have been?

Ans. About ten years.

Cross-examination by JOHN DANE, Esq., of counsel for complainant:

Cross-int. 17. When did Glazier make the change in the machine, as testified by you?

Ans. He made it about '82, previous to the time that I went into business for myself, December, '83.

Cross-int. 18. Was it November, or what month was it that Glazier made the change in the machine referred to?

Ans. I don't remember; it might have been a year before I went into business for myself.

Cross-int. 19. Really you do not remember what time the change was made? Is such the fact?

Ans. I know that it was previous to '83, because I bought some of these machines when I bought the business.

Cross-int. 20. It might not have been more than one or two months prior to your going into business?

Ans. No, sir.

Cross-int. 21. That is to say, the change referred to might have been made in either October or November prior to your commencing business?

Ans. Yes, sir.

Cross-int. 22. Did you assist in the change of the machine?

Ans. I did.

Cross-int. 23. What assistance did you render?

Ans. I invented the expansion box form now used on the machine.

Cross-int. 24. Which form does not appear upon the exhibit, about which you have been testifying?

Ans. Yes, sir; the block is on the machine now.

Cross-int. 25. Being that portion provided with the cavities and recesses?

Ans. Yes, sir.

Cross-int. 26. In what way have the Glazier box presses been upon the market, which you say has been about ten years?

Ans. They have been sold right out to different box-makers throughout the United States.

ALBERT G. POTTER.

Attest: WARREN K. BLODGETT, JR.,
Special Examiner.

27 *Deposition of John C. Metcalf.*

JOHN C. METCALF, a witness produced on the part and behalf of defendant-, being duly sworn, testifies as follows:

In answer to interrogatories propounded by Mr. Beach, and cross-interrogatories propounded by Mr. Dane.

Int. 1. What is your name, age, residence and occupation?

Ans. John C. Metcalf, Lynn, Mass.; age 49; occupation, dealer in paper-box machinery.

Int. 2. State what business experience you have had in this con--tion.

Ans. For the past six years it has been my business, buying and selling paper-box machinery the whole time.

Int. 3. What, if any, connection with the paper-box machinery did you have before this?

Ans. Previous to my going into this business I was engaged in the paper-box business, and bought machinery for manufacturing paper boxes.

Int. 4. Please look at the thing now shown you and marked Defendants' Exhibit Glazier Box Press, and state if you know what it is for?

(Objected to as immaterial.)

Ans. It is known as the Glazier foot press.

Int. 5. Have you ever seen one of these presses before?

(Same objection.)

Ans. I have.

Int. 6. Whether or not you have ever bought and sold, or otherwise dealt in these Glazier box presses?

(Same objection.)

Ans. I have bought, used, sold and dealt in them.

Int. 7. How long have you been acquainted with them?

(Same objection.)

Ans. For ten years. I went into business on my own account with another party about the year 1880; in 1882 we bought two of these machines for our own business, and used them for seven years. I then sold out my paper-box business, and since that time have been engaged in selling these machines.

Int. 8. Where have you sold these machines?

(Same objection, as being immaterial.)

28 Ans. In the New England, Middle and Western States, England and Canada.

Int. 9. Whether or not any of these machines to which you have referred contained a clamping device?

(Objected to as immaterial and indefinite.)

Ans. I don't understand what a clamping device is, applied to a machine.

Int. 10. Whether or not any one of these machines to which you have referred contained a work-support and a movable clamping plate or pressure foot?

Ans. The machines all have a work-support and a pressure plate.

Int. 11. Do you find in Defendants' Exhibit Glazier Box Press the work-support? If so, please point it out.

Ans. The horn with adjustable form is the work-support.

Int. 12. If this exhibit contains what you call the pressure plate, please point it out?

Ans. The plate at the top of the machine over the adjustable form is the pressure plate.

Int. 13. Whether or not you are familiar with the operation of this machine?

(Objected to as immaterial.)

Ans. I am.

Int. 14. I hand you a sample envelope box and will ask you to briefly explain the operation of the machine and whether it is adapted to operate on a box of this character?

Ans. The box being cut with a half-inch lip, the lip folded in, and the box being placed on the adjustable form, the end having been previously pasted is placed on the top of the box and pressed on by placing the foot on the treadle and bringing the pressure plate down on the box end.

(Counsel for defendants offer in evidence the box and box end to which the witness has referred, and the same are respectively marked Defendants' Exhibit Sample Box, W. K. B., Jr., sp'l ex'r, and Defendants' Exhibit Sample Box End, W. K. B., Jr., sp'l ex'r.)

Int. 15. Please mark the portions of the exhibit box which are the lips with the word "lips."

Ans. I have done so.

29 Int. 16. Please mark the portion of Exhibit Box End, that receive the paste, so as to indicate where the paste is put, in practice.

Ans. I have done so.

(The admission of the box and the marking of the parts are objected to by complainant's counsel, as being immaterial.)

Int. 17. Whether or not the Defendants' Exhibit Glazier Box Press contains any provision to adapt it for stock of different thicknesses?

(Objected to as immaterial.)

Ans. It has, a rubber spring or washer—these here.

Int. 18. Whether or not the machines which you say you bought for your own business in 1882 contained a work-support, a pressure plate, and a rubber spring or washer, to adapt them for stock of different thicknesses?

Ans. They did.

(Objected to as immaterial.)

Int. 19. Whether or not the Glazier machines which you have handled since that time contain the same provision for stock of different thicknesses?

(Same objection.)

Ans. All of them do.

(Cross-examination waived.)

JOHN C. METCALF.

Attest: WARREN K. BLODGETT, JR.,
Special Examiner.

Deposition of James A. Horton.

Direct examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence and occupation?

Ans. James A. Horton, Westmoreland, New Hampshire; age, 43; inventor and manufacturer of machinery.

Int. 2. Please look at the machine marked Complainant's Exhibit Defendants' Infringing Machine, and state whether or not you know anything about its origin?

30 Ans. I built several machines practically the same construction as said exhibit at my factory in Reading, Mass., where we used them in the manufacture of paper boxes. The first one I built, the working parts such as on this machine were attached to a power press of the ordinary make and run about six months in my factory, as stated before. I then caused drawings to be made, and filed application for a patent on the same, filed March 28, 1890. I worked the machine in my shop practically and showed

it to a great many box-makers. I then sold the patent to the defendants.

Int. 3. Is this the patent to which you refer?

Ans. Yes, sir; this is a copy of the patent No. 442,582, dated December 9, 1890.

(Counsel for defendants offers in evidence a copy of the letters patent referred to by the witness; the same is marked "Defendants' Exhibit Defendants' Patent.")

Int. 4. Whether or not the first machine you have alluded to was a practical one?

Ans. It was used practically for about six months.

Int. 5. Please give the date—the month and year, I mean—in which this first machine was completed?

Ans. About the last of September, 1889.

Int. 6. Is that machine in existence now?

Ans. It is.

Int. 7. Can it be produced?

Ans. I think it can be.

Int. 8. Is it your property?

Ans. It is not.

Int. 9. Whether or not that first machine differed in any material and substantial respect from Complainant's Exhibit Defendants' Infringing Machine, so far as the combinations of any two or more of the following elements are concerned: (1) Clamping dies having diverging working faces; (2) feeding mechanism constructed to deliver stay strips between said clamping dies; (3) pasting mechanism; (4) severing mechanism?

Ans. It did not.

(Counsel for defendants beg to state upon the record that he only learned of the existence of Mr. Horton's first machine this morning, and that he has not as yet been able to arrange for its production, but will endeavor to obtain the machine and put it into the case as exhibit.)

31 Int. 10. Now, Mr. Horton, please state fully all that you did, if anything, respecting your machines, after your first machine was completed, as you say, about the last of September, 1889.

Ans. I then built several machines from patterns and drawings designed especially for corner-staying machines very similar in design to the exhibit before me, and sold them for use in staying paper boxes in factories other than my own. I then sold the patent, as aforesaid.

Int. 11. Whether or not you ever exhibited the machines of which you are speaking to persons connected with the manufacture of paper boxes, with a view of disposing of your invention.

Ans. I exhibited the machine, both the original and the succeeding ones manufactured by me, to numerous parties, with a view of selling the machine and the patent.

Int. 12. Whether or not these succeeding machines to which you

have referred contained pasting mechanism, feeding mechanism, severing mechanism, and clamping dies having diverging working faces, substantially as they are found in Complainant's Exhibit Defendants' Machine.

Ans. They contained all the features referred to substantially as shown in said machine.

Int. 13. When was it that you first exhibited the original and succeeding machines manufactured by you, as referred to in your answer to interrogatory 11?

Ans. I exhibited the original machine to parties before and after I made application for letters patent on same.

Int. 14. How long before you filed your application did you exhibit the original machine?

Ans. That I couldn't tell—it might have been two months. It was set up and run in my shop, open to the view of all the help and whoever passed through the shop.

Int. 15. Did you exhibit this machine in the fall of 1889?

Ans. I did

Int. 16. To whom?

Ans. Theodore Pinkham and his representatives.

Int. 17. Give the names of the parties, so far as you remember them, and state what their relations to the trade were at that time.

Ans. Mr. Pinkham at that time was New England agent for the American Straw Board Company. Mr. Charles Wells, also in the employ of the American Straw Board Co. Mr. John Simpson, also in same employ; and they brought many paper-box manufacturers to see the machine; also Datz Bros. of Philadelphia came to my factory to see the machine, having learned of its existence through the representatives of the American Straw Board Co.

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Int. 18. Please look at these dies and state what they are, if you know.

Ans. These dies were made to stamp an advertisement on the back of wire brushes. They are made in a peculiar manner to compensate for unevenness in the thickness of the two edges of a brush back, and also the unevenness of the thickness of different backs. The rubber cushion on the top and also under the bottom on the bed of the press in which it was used, making a yielding pressure on the same; this die was made in my shop by my instructions about eight years ago, and has been in use from time to time ever since.

Int. 19. Explain how they are mounted and used in practice.

Ans. This upper die, as we term it, which contains the engraving, is mounted in the reciprocating plunger of any power press. The die containing the rubber cushion is placed on the bed of the same machine, brush backs which were interposed between the two parts of the die were exposed to a yielding pressure by the cushion of the die.

Int. 20. Supposing the two dies to which you have referred assembled in a power press—can you make any comparison between the

under die and any part of Complainant's Exhibit Defendants' Machine?

(Objected to as immaterial.)

Ans. The lower half of the die would be represented by the support on which the box is hung while receiving the corner stay in defendants' machine.

Int. 21. Whether or not the upper brush die would be comparable to any part of Complainant's Exhibit Defendants' Machine.

(Same objection.)

Ans. The upper die would be represented in the same position on the machine as the re-entrant angle die in defendants' machine.

Int. 22. Whether or not the function of rubber strips or sheets in the brush-starting contrivance is comparable to anything in Complainant's Exhibit Defendants' Machine.

(Same objection.)

Ans. I don't see it.

Int. 23. Don't see what?

33 Ans. Anything comparing with it—not in this machine. I have tried the machine and find a motion elastic in its nature, suitable to give a yielding pressure on the box to be stayed, corresponding with the yielding pressure on the brush handle in the dies mentioned or exhibited.

Int. 24. How long do I understand that these dies with the rubber cushion have been in use?

(Objected to as immaterial and irrelevant.)

Ans. About eight years.

(Counsel for defendants in error offers in evidence the dies the witness has referred to and the same are marked "Defendants' Exhibit Horton's Brush Dies, W. K. B., Jr., sp'l ex'r.)

(Mr. Dane objects to the admission of the exhibit referred to, as wholly immaterial and irrelevant.)

Int. 25. Without reference to the brush dies about which we have been speaking, I would like to ask you whether or not before January 1st, 1885, you ever saw in any class or classes of machinery the combination of opposing clamping dies, one of which was constructed to act with an elastic or yielding pressure upon interposed work of varying thicknesses?

(Objected to as leading and as also immaterial and irrelevant.)

Ans. Dies have been made for sheet-metal works with yielding top and bottom, one or the other, to compensate for the difference of thicknesses of sheets of tin, for 25 years, and are in common use in all large sheet-metal working establishments; also the dies in a heeling machine for putting heels on boots and shoes have been made by the McKay Association, with a spring in the plunger of the machine carryine the dies to allow for the variation in thicknesses of boot heels.

Cross-examination by JOHN DANE, JR., Esq., of counsel complainant:

Cross-int. 26. What was the real difference between the first m chine that you made and the machine before you, marked Compla ant's Exhibit Defendants' Infringing Machine?

Ans. In principle they are the same, with one exception; t first machine I made had no yielding pressure in the plunger otl than the elasticity of the frame or body of the machine, which w not constructed for a corner-staying machine, but was a small pow press such as we made for the market for the use of jewel
34 manufacturers, and had the moving parts which perform the same operations as the moving parts in the exhibit ferred to.

(Answer objected to as irresponsive and the question repeated.

The power press that we used was arched or overhanging front, and the mechanism similar to what is in here, differing or in size of its parts and not in principle, so as to adapt it to go i a smaller space than is permitted on the frame of the machine fore us.

Cross-int. 27. About what were the variations in size of the seve factors of the first machine about which you have testified from t factors or parts contained in the Complainant's Exhibit Defendan Infringing Machine?

Ans. The water box was smaller, the roll in the same lyi lengthwise in order to take less space, the anvil in front of the m chine on which the box hangs was shorter and smaller, the fe mechanism a little different in construction of its individual piec and only permitted about one-half the feed motion of the machi exhibited as the press on which I mounted it was of such constru tion with a solid back that the gum strip of which the stays we made had to come up in front of the column of the machine fr underneath the bench on which it set, instead of from the back.

Cross-int. 28. Did you make any change whatever in that fi machine about which you have testified after you first construct it, and if yea, what?

Ans. Yes, we changed the shape of the feed point or dog seve times to see if we could improve its feeding power.

Cross-int. 29. Why did you wish to make the changes referred in your last answer?

Ans. Because we had some trouble with the gum of the st sticking to the slide of the feeding mechanism.

Cross-int. 30. When did you first get the machine to work sat factorily—what month?

Ans. In the latter part of September or the fore part of Octob 1889.

Cross-int. 31. Can't you state positively the month?

Ans. I can't do it from memory.

Cross-int. 32. That is to say, because your recollections are clear?

Ans. No; it is because I have no data, on which to remember the date, excepting the date of the filing of the application printed on the copy of the patent exhibited.

35 Cross-int. 33. But the patent itself does not refer to the date when you considered that you had got your machine perfected—is such the fact or not?

Ans. Only so far as that I had my machine made and running at my factory, as nearly as I can remember, about six months before the filing of the application.

Cross-int. 34. Then, if I understand your last answer, you now state in substance, that it was prior to September, 1889, that you made the machine in question, but had it perfected in September, '89. Am I correct in my inference?

Ans. The machine I built, or I would say, part of the machine, as it was attached to a press already in use in my factory, it did not take more than a week to build and perfect all there is on the machine, to make it put stays on boxes over and above what the machine itself was before converting it into a corner-staying machine, which was about the time stated—the last of September or the first of October.

Cross-int. 35. But you say you cannot recollect definitely, dates within which or at which the machine was actually perfected—meaning the first machine?

Ans. I can't say nearer than the time stated.

Cross-int. 36. State the date when you first had the first machine in condition for staying the corners of boxes practically?

Ans. As near as I can recollect, by the first of October, 1889.

Cross-int. 37. And you will swear that you used it practically for staying the corners of boxes before the 23d day of October, 1889?

Ans. To the best of my recollection the machine was in use at not a later date than the first of October, as before stated, and was operated in my factory to put corner stays on boxes constantly from that time until I had new patterns and designs and new machines constructed from the same, to take its place; and that the machine when last seen by me (about six months ago) was still in working order, and if the owners have not changed it, is in working order at the present time.

(The statement of the witness is objected to as not an answer to the question and therefore the question is repeated.)

I wouldn't swear positively.

(Adjourned to December 16th, 10 a. m.)

Met, pursuant to adjournment, at 10 a. m., Dec. 16, 1892, at 27 School street, room 92, Boston, Mass.

36 (Witness desires to state that since the adjournment he has looked up memoranda which enable him to swear positively that the machine was in use in his factory before October 23d, 1889.)

Cross-int. 38. Who was present with you at the time that you first operated the corner-staying machine which you say you made about six months prior to your application for a patent?

Ans. I cannot give the names of all that were present. It was started in my machine shop in the presence of whatever help was employed at that time and any other parties who may have happened to be in the shop.

Cross-int. 39. Are you certain that there were others in your shop at the time referred to in my last question?

Ans. I am.

Cross-int. 40. Give the name or names of such as you distinctly remember that were present at the time, excepting, of course, your workmen.

Ans. The machine was not started in my presence, I being absent for the day. The men in the shop started the machine, and as the shop doors are not kept closed, there is most always people present. Soon after it was taken from the machine shop upstairs to the paper-box room and there run by the girls who made paper boxes.

Cross-int. 41. Had you any associate or partner in business at the time of the completion and operation of the machine referred to, and if yea, state the name or names of such?

Ans. I had. William Proctor of Reading, Mass.

Cross-int. 42. Did Mr. Proctor have full knowledge of what was done by you and the others on the machine referred to?

Ans. Mr. Proctor took sick about the latter part of February, '89, and never was able to be out of his bed until his decease, October 23d, '89, but knew of the machine only as I informed him when I saw him and he was able to bear talking to on business.

Cross-int. 43. Did you employ a foreman in your workshop during the time you were constructing and first operated the first corner-staying machine that you say you made?

Ans. I did.

Cross-int. 44. Give his name, and at the same time state where he now resides and where employed.

Ans. Oliver L. Ackerley, Reading, Mass., one of my successors in business.

37 Cross-int. 45. What circumstances, if any, prompted you to make the first machine for staying the corners of boxes?

Ans. I also manufactured paper boxes for my own use at the time I made machines, and the necessity for a staying machine in my own shop caused me to change over one of our small power presses for this purpose.

Cross-int. 46. But prior to this time referred to in your last answer you had seen, or had been informed, concerning the machines for a like purpose—had you not?

Ans. I knew there were such machines in the market, but did not have one in my factory.

Cross-int. 47. Did your original application for a patent pass through the office promptly and without material objection on the part of the officials of the Patent Office?

Ans. No, sir; there was some delay and some references in regard

to the patent; what they were, I cannot say, as I always left those things to my patent attorney.

Cross-int. 48. Did he indicate to you at any time before the grant of the patent about which you are testifying, that the claims were materially modified from what had been originally filed in connection with the application referred to?

Ans. My patent attorney informed me that several of the claims had been objected to, and I gave him instructions to modify them and get the patent as far as would be allowed.

Cross-int. 49. What did Theodore Pinkham and his representatives say about your corner-staying machine when they first examined it, as you have stated?

Ans. They were much pleased with the machine, and Mr. Pinkham, as representative in New England, of the American Straw Board Co., wished to purchase the patent as soon as it would be allowed and issued, and did not wish that I should exhibit it to outsiders other than parties whom he or his representatives should bring to see it. They brought a great many paper-box manufacturers to see the machine. Before the patent was issued, however, there was a change made in the New England agency, and Mr. Pinkham dissolved connection from the American Straw Board Co. and this broke up the negotiation.

Cross-int. 50. Was Mr. Pinkham the only one, prior to Mr. Hobbs, that had considered purchasing the patent from you?

Ans. The only one that I know of.

38 Cross-int. 51. As a matter of fact, did you know, or were you not informed, that the reasons why Mr. Pinkham or others did not care to purchase the patent in question was because the owners would be likely to be followed by a lawsuit in event of the manufacture or use of the machine so patented by you?

Ans. Mr. Pinkham and his representatives stated that they supposed owners of other patents might bring suit, but that did not interfere with their buying, as they were satisfied there was no patent in existence covering or claiming to cover any part of the machine or principle that was good enough or broad enough to be successful in a suit against it, and that had nothing to do with the breaking off of a negotiation with the American Straw Board Company.

Cross-int. 52. Give the name of the Pinkham representatives to whom you have alluded several times in giving your testimony.

Ans. I have given their names once in my testimony already, but will repeat: C. M. Wells, John Simpson and another, but I don't know his name. They brought many people to see the machine, whom I did not know, that were customers of theirs for paper-box materials.

Cross-int. 53. When first did you have knowledge of complainant's patented machine for staying the corners of boxes?

Ans. I cannot say; I have no data to go by. Should judge, about the beginning of '89.

Cross-int. 54. And you had such a machine at your shop, did you not, early in 1889?

Ans. I had, but not in use.

Cross-int. 55. Did Mr. Beach, the plaintiff in this case, ever call upon you and ask the privilege of seeing your staying machine?

Ans. He did; not at my factory, to my knowledge, but in Boston.

Cross-int. 56. Did you give your consent and allow him to examine it?

Ans. I did not. We never allow competitors to examine our machines until we get ready to put them on the market, then they have the privilege of examining the same.

Cross-int. 57. Do you remember distinctly the date at which Mr. Beach made the application to see your machine?

Ans. I do not, it was some time when I was in Boston, I happened to meet Mr. Beach on the street.

39 Cross-int. 58. Can't you state whether it was in 1875 or 1892, or some date, from your best recollection?

Ans. Would say, it was in the winter or spring of 1890.

Cross-int. 59. And have you stated the best and nearest date that you are capable of giving, as to the time referred to in my previous question?

Ans. I have.

Cross-int. 60. Was it prior to the month of March, 1890, that Mr. Beach made such application and you refused?

Ans. I could not say; it might have been before, it might have been after.

Cross-int. 61. Why did you fear Mr. Beach as a competitor?

Ans. Because I had understood that Mr. Beach had threatened any person who would put a corner-staying machine on the market, and at that time I had understood they had a suit pending with Mr. Inman, who was manufacturing a corner-staying machine which was already in the market.

Cross-int. 62. And for that reason you did not care to have Mr. Beach see your machine—is such the fact or not?

Ans. I did not wish to get into litigation until I was ready, consequently did not wish to allow Mr. Beach to examine my machine.

Cross int. 63. When did you sell your patent, and to whom—meaning your patent for staying the corners of boxes?

Ans. I sold it to the Hobbs Mfg. Co. soon after it was issued, but they failed and it reverted back to me; I afterwards sold it to Richard Sugden about the first part of the present year.

Cross-int. 64. How soon after the issue of the patent did you sell it to Hobbs Mfg. Co. as stated?

Ans. If I remember correctly, I agreed to sell it very shortly before it was issued, and sold it as soon as it came, possibly a week or two.

Cross int. 65. Did you not offer to sell the patent after it was issued to one James C. Marshall?

Ans. I cannot say whether I had the patent at that time or whether I was in negotiation with Mr. Hobbs at that time. I do not know Mr. Marshall personally, but may have offered it to him.

Cross-int. —. As a matter of fact, Mr. Horton, had you not offered it for sale to at least two other parties other than Marshall, the

Hobbs Mfg. Co., and Mr. Sugden and his partner, after the patent had been issued to you?

40 Ans. If I recollect right, I did; it could not have been that I agreed to sell it to Mr. Hobbs before it was issued, as I do recollect of offering it to other parties who had copies of the patent from me.

Cross-int. 67. And these several offers to sell the patent was during the period, and while you were running a machine shop or a shop for constructing machinery—is such the fact or not?

Ans. It is.

Cross-int. 68. And you continued to run such shop until when?

Ans. The 9th day of May, 1891, when it was put into a corporation, and I with others continued until March of this year, 1892, when I retired.

Cross-int. 69. What, if anything, does Exhibit Horton Brush Die, contain that is found in the Complainant's Exhibit Defendants' Infringing Machine?

Ans. The yielding pressure exerted on the material in operation to make up for unevenness of thickness in the same.

(Answer objected to as irresponsive, and question repeated. Witness expresses inability to answer differently.)

Cross-int. 70. Do you remember anything of the conversation had between yourself and Mr. Beach at the time that he asked to see your machine?

Ans. I could not repeat it, but some of it related to his patent on the machine he was manufacturing, and he claimed, as many other patentees do, that a staying machine could not be constructed that would not infringe his patent. I think this is the substance of the conversation.

Cross-int. 71. And the last portion of your last answer is predicated upon your own judgment and standing as an inventor and patentee—is not such the fact?

Ans. I don't understand the question.

(Counsel for plaintiff requests the examiner to read the previous question and answer in connection with the last one, and then state whether he understands the question or not.)

(Witness says he does not understand the word "predicated.")

(Plaintiff's counsel states that he may substitute the word "based" in lieu of the word "predicated" if it will make it plainer, as it means the same thing.)

Ans. 2. No, sir. I do not think any machine for any purpose has been constructed yet but what the same ends could be accomplished in other ways without infringing.

41 Cross-int. 72. And your last statement is the best answer that you are capable of giving to cross-interrogatory 71, and the explanations made and substitute word given?

(Witness requests that the clause referred to be re-read to him.)

(Examiner reads clause referred to and witness states as follows:)

In my answer to cross-interrogatory 70, I do not know that I made my views plain. Inventors, when they get a patent, as a rule, think and claim that their invention covers the ground for which it is made so fully that nobody else could make an invention accomplishing the same end without infringing his rights. I do not mean to state that other inventors claimed anything in regard to corner-staying machines, such as Mr. Beach was making, but that Mr. Beach claimed for his own patent as other patentees do for their patents, that his machine was the only one that could be made for staying boxes, without infringing his patent.

Cross-int. 73. You presume, then, that you claimed and covered under your patent, all that Mr. Beach claimed to cover, I infer from what you have said in connection with cross-interrogatory 70?

Ans. I do not. I claim to cover just what my patent allows, nothing more.

Cross-int. 74. Did Mr. Beach in his conversation with you claim to cover more than the claims of his patent covered?

Ans. I did not know what Mr. Beach's claims were. I do not know now; he did not have them to show me—if he did, he didn't show them.

Cross-int. 75. Then, if I understand you correctly, Mr. Beach did not claim, neither can you remember the words and language used by him, sufficiently well to repeat the substance of it at this time?

Ans. I can remember simply of having conversation with Mr. Beach, in regard to corner-staying machines, and his statements were to the effect that his patent was so broad that a corner-staying machine could not be constructed without infringing his patent. That was his opinion.

Cross-int. 76. Did Mr. Beach explain to you why he claimed so broadly?

Ans. He may have. I met Mr. Beach several times and we talked of corner-staying machines. He made statements in regard to claims that he said he had, which in my opinion as an in-
42 ventor, was already in public use and had been known to the art for years before the date of his application for patent.

(Answer objected to as irresponsive, and question repeated.)

Mr. Beach explained to me that his patents were broad enough to cover principles in his machine which, in my opinion, were in public use years before his invention.

Cross-int. 77. What did Mr. Beach say to you?

Ans. I cannot give the words of the conversation.

Cross-int. 78. Who was present besides Mr. Beach and yourself at the time of this alleged conversation?

Ans. I do not remember of anybody being present.

Cross-int. 79. But you are not absolutely certain about it, whether there was or was not?

Ans. I do not remember of having conversation with Mr. Beach, only as I met him on the sidewalk, and do not know of anybody being present to hear our conversation.

Cross-int. 80. Then you have been giving your opinions based

upon indistinct recollection of a conversation had between yourself and Mr. Beach at the time referred to? Is not such the fact?

Ans. No; there is no indistinct recollection about having conversation with Mr. Beach. I met Mr. Beach quite often, and we talked as other people that were acquainted, but I cannot remember all that he had said.

Cross-int. 81. But do you distinctly recollect the language used by Mr. Beach upon the occasion referred to?

Ans. I do not.

Cross-int. 82. Do you recollect going to Mr. James C. Marshall with a copy of your patent at the time you called upon him to make a sale of it to him?

Ans. I think I did carry a copy of the patent to Mr. Marshall, as I had several copies for that purpose.

Cross-int. 83. Who had charge in your shop in 1889 and 1890, and who gave general instructions as to the making and building of the various machines made at your shop during that period?

Ans. Whatever machines were designed by me that we built I furnished the drawings and the design made by myself to the foreman in charge, Oliver L. Akerley, and he gave instructions to the men from time to time, as needed.

Direct examination resumed:

Redirect Int. 84. What, if anything, have you done about getting the first machine that has been referred to?

43 Ans. The first machine I looked at this morning; it was partially disassembled; I had it put together and ordered shipped in by express, and it may be here this afternoon. I expect it.

(Adjourned till 3 p. m. Friday, Dec. 16.)

(Pursuant to adjournment, met at 3 p. m.)

Redirect Int. 85. Can your produce your original machine that has been referred to.

Ans. This is the original machine referred to.

(Counsel for defendants offers the machine in evidence and the same is marked "Horton's Original.")

(Mr. Dane, for the complainant, objects to the introduction and admission of the machine referred to on the ground, among other things, that it is irrelevant, incompetent and immaterial.)

Redirect Int. 86. You have testified that you had one of Mr. F. Beach's corner-staying machines in your shop early in 1889; please state whether or not you ever examined that machine. Answer fully.

(Question objected to on the ground, among other things, that the witness has already testified that he was familiar with or knew of the machine before it was sent to his factory, therefore immaterial.)

Ans. The machine was shipped to my shop—meaning, my ma-

chine shop—to be fitted with a patent clutch and stop motion which I was then manufacturing; it came packed in a case; I simply saw it as it set in the case with the cover of case removed, and gave orders to the foreman to fit it with a clutch and stop motion, which he did. I do not remember of seeing the machine while in my shop at any other time. My time in the shop was about one hour per day—the rest of the time I being absent. I was not in any way familiar with the machine in its make-up at that time and had no use for a corner-stay machine at that time.

Redirect Int. 87. Are there any facts within your present recollection which enable you to state positively when it was that this exhibit, Horton's Original, was completed and ready for practical use? If so, make such statement as you see fit.

Ans. The exhibit machine was in use at my factory before Mr. Proctor's decease, October 23, 1889, and was in the account of stock taken by the appraisers in settling up the business with the heirs of the deceased.

Redirect Int. 88. About how long before?

Ans. As near as I can remember, I should say four weeks.

44 Cross-examination resumed:

Recross-int. 89. Are you willing to swear positively that the machine referred to in your last answers was in use as much as fourteen days prior to the 23d day of October?

Ans. As nearly as I can remember, yes.

Recross-int. 90. Without any qualifications, I ask you to give a direct answer to question 89.

Ans. I am.

Recross-int. 91. As you are so positive concerning the time, I ask you to tell the court what enables you to swear with a certainty that the machine in question was in practical use fourteen days before the 23d of October, as stated.

Ans. Because the machine was in use before Mr. Proctor's death as much as a month, according to my recollection, and was in practical use the next day after it was made.

Recross-int. 92. Your statements, then, concerning the dates are simply from recollection—is such the fact?

Ans. In connection with Mr. Proctor's death, which is a matter of record in Reading, Mass.

Recross-int. 93. Did you ever know a man by the name of George H. Allen?

Ans. I do not, and never did.

Recross-int. 94. Do you not remember that a man was sent to your shop to examine your machine on the part and behalf of Mr. Pinkham, to whom you have alluded from time to time in your testimony, for the purpose of investigating and reporting to Mr. Pinkham and his associates as to the value, character and scope of your supposed invention contained in the machines made by you, for staying the corners of boxes?

Ans. I do not know of any man being sent for any such purpose.

Mr. Pinkham and his representatives at different times brought men to see the machine; I don't know their objects; suppose they were intended purchasers of the machines.

Recross-int. 95. For about what length of time have you been engaged in box-making business, and where?

Ans. I do not know the exact length of time we have made boxes; it may have been six or seven years, but I did not make boxes as a business until since Mr. Proctor died. We simply made boxes for our own goods, and about the time of Mr. Proctor's death I commenced to make boxes for outside parties in addition to our other business. Before Mr. Proctor's illness, what boxes were made were made under his supervision, I being on the road most of the time as salesman of the machinery we were building for sheet-metal work.

Recross-int. 96. Judging from what you have stated in your last answer, you had use for boxes some time prior to beginning the manufacture of them for your own use; consequently, knew of the various firms and concerns engaged in the box-making business about Reading and Lynn; is such the fact or not?

Ans. There was no factory for making boxes in Reading at that time, except one who made for their own use only. I did not know, nor do not know now, a box-maker in the city of Lynn.

Recross-int. 97. What was the name of your foreman at the time your first corner-staying machine was made, and in connection, state whether he had charge of the construction of the machine referred to.

Ans. Oliver L. Ackerley was foreman of the machine shop at that time, but all experimental machines made in the shop were designed by myself and given to him piece by piece in drawings on paper, and he executed the work.

Recross-int. 98. How long prior to September of that year was he foreman at your shop?

Ans. I cannot say definitely. He was in my employ, I should say, ten years prior to that time, and, as near as I can recollect, about five years—four or five years—foreman of the machine shop.

Recross-int. 99. During the year- 1890, 1891, 1889, and 1887, did this man Akerley have sole charge of matters about your machine shop, excepting such directions as you might give him from time to time?

Ans. He did.

Recross-int. 100. And you consulted with him from time to time, more or less frequently, every day, that you might be about the shop or shop premises?

Ans. I did.

Recross-int. 101. And so in this way you kept informed about your business and work going on in and about your machine shop and thus became familiar with all the matters therein?

Ans. No, I run the machine shop myself; he took his orders from me; I knew what was going on in the machine shop without his telling me; he simply executed my orders and built such machines and parts of machines as I gave him instructions to build.

46 Recross-int. 102. Do you mean to say now, that you kept yourself that fully informed as to matters and things going on in your machine shop, that it became unnecessary for your foreman or others to tell you, either about orders or other matters that might be presented to any of them in your absence, and that neither foreman nor workmen ever explained orders, proposals, and other matters to you, received at the shop in your absence?

Ans. There were no orders received at my shop except what I brought myself. I did the selling, and the bulk of the machines we built were of special design and the orders for the same were taken by myself and explained to the foreman, how they should be executed.

JAMES A. HORTON.

(Adjourned to 10 a. m. Saturday, Dec. 17.)

Attest: WARREN K. BLODGETT, JR.,
Special Examiner.

BOSTON, *Dec.* 17, 1892.

Parties meet, pursuant to adjournment.

Deposition of Charles E. Sawyer.

Direct examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence, and occupation?

Ans. Charles E. Sawyer, sup't of Dennison Mfg. Co., age 56, 6 Ellis St., Roxbury.

Int. 2. How long have you been connected with the Dennison Mfg. Co.?

Ans. Ever since 1879.

Int. 3. In what line of business were you engaged before 1879, and where?

Ans. Tag-making and card-board, on the same premises.

Int. 4. Are you the Charles E. Sawyer to whom U. S. letters patent No. 166,940 were granted August 24, 1875?

Ans. I am.

(Counsel for defendants offers in evidence a copy of letters patent referred to by witness, and the same is marked "Defendants' Exhibit" Sawyer's 1875 Patent, W. K. B., Jr., sp'c'l ex'r.")

(Counsel for defendants also offers in evidence a duplicate of the model filed in the matter of the letters patent granted to Chas. E. Sawyer August 24, 1875, No. 166,940, for improvement in
47 label and tag machine, the said duplicate model being duly certified under the hand and seal of the Commissioner of Patents, and the same is marked "Defendants' Exhibit Sawyer 1875 Model, W. K. B., Jr., sp'c'l ex'r.")

Int. 5. Please look at the head now shown you and state if you can tell what it is and where it came from.

Ans. This is a head for putting patches upon tags. It came from the Dennison Mfg. Co.

Int. 6. How long have you been personally familiar with machines like this head to which you have just referred?

Ans. Since 1865 or 1866.

Int. 7. How long have machines like the one to which you are now referring been in use?

Ans. I should think 27 or 28 years.

Int. 8. Where?

Ans. At Roxbury, 25 Dale street. This machine was in the Perkins factory originally and now in the Dennison Manufacturing Company at Roxbury.

(Counsel for defendants offers in evidence the head referred to by witness, and the same is marked "Defendants' Exhibit Dennison Tag Machine," W. K. B., Jr., sp'c'l ex'r.)

(Plaintiff's counsel objects to the admission of the machine offered in evidence on the ground that it is irrelevant, incompetent and immaterial.)

Int. 9. Please look at the strips I now show you and state if you know what they are.

(Objected to as immaterial.)

Ans. We call them patch strips, out of which we punch patches to put on labels.

(Counsel for defendants offers strips referred to by witness in evidence and the same are marked "Defendants' Exhibit Label Patch Strips.")

(Same objection by plaintiff's counsel as made to the offer of the machine just offered in evidence.)

Int. 10. Please explain the construction, mode of operation and object of Defendants' Exhibit Dennison Tag Machine.

(Objected to as immaterial and as incompetent, for the reason that the witness has not been shown to be qualified to testify concerning the construction and operation of the exhibit referred to.)

Ans. The patch strips, as we call them, are gummed, or not gummed, as we see fit to make them; if they are previously
48 gummed, we pass them through a wetting device and into the Dennison head, the two gummed sides towards each other, and then into feed-rolls, and draw the patch stock through by the waste.

Int. 11. Please explain more in detail what is done, what is accomplished.

Ans. What we accomplish by so doing is this: We pass the *the* paper between the two patch strips, and in this head are punches and plates; the two patch strips are passed over the plates and under the punches; the tag paper is passed between the two plates; by mechanism the two punches drive out a washer or patch and fasten it to the tag stock or body of paper.

Int. 12. You say that the punches drive out a washer. Just what do you mean by that?

Ans. A washer or patch to strengthen the end of the tag.

Int. 13. Does the tag I handle illustrate what you mean?

Ans. It does.

(Counsel for defendants offers in evidence a tag which is marked "Defendants' Exhibit Illustrated Tag," W. K. B., Jr., sp'c'l ex'r.)

Int. 14. Please enumerate and name the elements or factors or mechanical instrumentalities which are grouped together in the Dennison tag machine.

Ans. First, a wetting machine; second, a punching machine; third, feeding mechanism.

Int. 15. What is the character of the feed?

Ans. A roll feed.

Int. 16. Is it continuous?

(Objected to as leading.)

Ans. It is intermittent.

Int. 17. What parts, if any, co-operate to punch out the washers?

Ans. I don't think that question is put so that I can answer it.

Int. 18. What happens to the washers after they are punched out of the strip?

Ans. After they are punched out of the strip they pass through the plate onto the tag, and are made to adhere there by the gum or glue.

Int. 19. What makes them adhere there?

Ans. The pressure of these two punches coming together.

Int. 20. What are the elements in the Sawyer 1875 model? Enumerate and name them.

49 Ans. A feeding mechanism and plungers made to cut off a strip and fasten the pieces cut off on both sides of a tag.

Int. 21. What do these metallic pipes or tubes represent in this model?

Ans. Steam pipe.

Int. 22. For what purpose are they, if any?

Ans. For heating boxes.

Int. 23. As superintendent of the Dennison Manufacturing Company what are your duties?

Ans. The entire charge of manufacturing and general supervision of the whole work at Roxbury.

Int. 24. What experience, if any, have you had with machinery?

Ans. I learned the trade; been manufacturing machinery for 38 years.

Int. 25. Supposing you had had a full-size working label or tag machine made after Defendants' Exhibit Sawyer 1875 Model of the invention shown in your patent No. 166,940 of August 24, 1875, and that some one, say before (to get a convenient date) we will say 1880, had suggested to you that it would be desirable to put a reinforcing or strengthening patch or strip upon stock that was not flat like a tag, but say, curved or angular at the point required to be

strengthened, what change, if any, in that supposed machine would have been necessary?

(Question objected to as improper, indefinite and irrelevant.)

(Counsel for defendants says, You may add to the question the words, "to effect the desired object.")

(Notwithstanding the amendment to the question, plaintiff's counsel insists that the objection already made was proper, and adds that it is not a question at this time what might have been done, but really a question as to what existed prior to the date of complainant's patent, showing the combination of factors adapted to do the work described in the complainant's patent.)

Ans. I can't say what I would do until I knew what a man wanted to be done.

Int. 26. Suppose he said he wanted to stay box corners?

(Objected to as indefinite.)

Ans. Then I should say, with the present mechanism, that I could take out the lower punch, or leave it in, by making a V groove to correspond with the corner box, and a corresponding groove in the upper punch that I could stay the corner of a box.

Int. 27. What are the heating boxes for, in the '75 model of machine?

(Objected to as the purpose of the boxes referred to is clearly set forth in the patent in evidence, covering the model referred to.)

Ans. The object is to warm the glue, that it may fasten to the paper stronger and more tenaciously.

Int. 28. Whether or not your 1875 model contains: (1) Opposing clamping dies; (2) a feeding mechanism; constructed to deliver stay strips between said clamping dies; (3) a pasting mechanism for rendering adhesive the stay strips, said clamping dies being constructed to co-operate in pressing upon interposed tag stock, severed sections of the adhesive stay strips. You may answer the question on the assumption that by "pasting mechanism" is meant either mechanism which puts paste or gum on the strip when it is traveling, or mechanism which makes an already gummed strip adhesive at the time that adhesion is wanted.

(Question objected to as leading in its nature, presumptive without justification, and as assuming in the question, things not supported by any evidence in this case; therefore improper and inadmissible under the ordinary rules of the courts upon evidence of like character. Furthermore, the witness has not stated that the machine was capable of feeding stay strips, or that the witness understands the meaning of the word "stay" as evidently is intended to apply in this case, neither has he referred to, nor has he stated that the model referred to contains opposing clamping dies, in setting forth the various features contained in the model referred to.)

Ans. It does.

(Direct examination closed.)

Cross-examination by JOHN DANE, JR., Esq., of counse complainant:

Cross-int. 29. What is the stay strip referred to, and what do stay?

Ans. It stays both sides of a tag, as now made, for the purpo making the tag stronger.

Cross-int. 30. That would be a reinforce, would it not, r than a stay?

Ans. The usual term is a "reinforce."

(Answer objected to as irresponsive and question repeated.)

It is a reinforce.

Cross-int. 31. And not a stay?

Ans. I think a reinforce is a stay.

51 Cross-int. 32. Excepting to reinforce by increasing thickness of the tag to give it greater strength for the t or wire by which the tag is usually applied—what is its object

Ans. It has no object except to do that.

Cross-int. 33. Is it possible for you to take the Dennison tag chine, or the Sawyer model, and apply a staying strip to unit corners of a box when the sides are bent at right angles i proper form, and so unite the two sides by a piece over the co by a staying strip without a reorganization of such machine model?

Ans. The Dennison machine would require considerable a tion, but not in principle. The Sawyer machine would not re very much alteration, and in the alteration I don't think it w change the combination. I might add to the stay the corner box.

Cross-int. 34. Give your definition, please, to the term "princ as you have used it in connection with your last answer.

Ans. The principles involved in this machine are a fe mechanism, punches and dies, in combination with a wet stri

(Answer objected to as irresponsive and question repeated.)

I will cross out the word "principle" and make it read "arr ments."

Cross-int. 35. That is to say, you would like to substitute fo word "principle" in your answer to cross-interrogatory 33 word "arrangements." Is that so?

Ans. I would.

Cross-int. 36. Then I understand you to say, that the Den machine, although requiring considerable alteration, to enable apply stay strips to the corner of a box and unite securely the of the two sides as they come together at the corners, but t rangements of parts would not be changed; is that so?

Ans. What I mean by change of arrangements, I would no pose of the punches, the feed-rolls, nor the gummed strips; I w simply shift their position in the Dennison machine.

Cross-int. 37. That is to say, to reorganize, modify, and several changes.

Ans. Now I don't understand what you mean.

Cross-int. 38. What contained in my question you failed to comprehend?

Ans. Well, in shifting the position of things necessarily
52 calls for quite a change in the parts that hold them together, and therefore appears like a great alteration, when in fact, it is not.

Cross-int. 39. If there were only a change in the parts for holding the various elements or factors contained in the Dennison machine, would it not then require other and further alterations and modifications?

Ans. It would.

Cross-int. 40. And it would require these various alterations and modifications referred to in order to make a practical corner-staying machine for uniting and securing the side corners of boxes together?

Ans. It would.

Redirect examination by Mr. BEACH:

Redirect Int. 41. If you wanted to have these various alterations and modifications referred to made, for which would you send—somebody known as "an inventor," or for an ordinarily skilled mechanic?

(Objected to as not only highly improper, but wholly incompetent.)

Ans. What do you mean by "inventor"?

(Counsel for defendants states that he used the word "inventor" in the question to indicate one who, in arriving at a mechanical result, exercises the higher powers of the mind and displays ingenuity and originality—as distinguished from the ordinarily skilled mechanic.)

Well, in this case I should think an ordinarily skilled mechanic could make the change.

Recross-examination by Mr. DANE:

Recross-int. 42. Do you mean to say, of your own knowledge, that it would not have required invention to formulate, arrange, combine, and adapt a machine to automatically apply strips upon the corners of the sides of paper boxes in a manner to close over and unite such corners in the manner described in complainant's patent, even with the existence of the Dennison machine?

Ans. I do not.

CHARLES E. SAWYER.

Attest: WARREN K. BLODGETT, JR.,
Special Examiner.

(Adjourned to 1.45 p. m.)

53 *Deposition of Rufus B. Fowler.*

Direct examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Int. 1. What is your name, age, residence and occupation?

Ans. Rufus B. Fowler, 51 years, Worcester, Mass., solicitor of patents.

Int. 2. What experience have you had as solicitor of patents and in the comparison of mechanisms with letters patent and with each other, and has your occupation ever led you to heretofore act as an expert in patent causes?

Ans. I have been connected with mechanical pursuits for the last 25 years as manufacturer, as designer and builder of special machinery for various purposes, and during the last 16 years I have been almost exclusively employed, both as solicitor of patents and as expert in patent cases, in the examination of patents and patented structures of various kinds.

(Plaintiff's counsel objects to the fore part of the answer as proffered and not in response to the question.)

Int. 3. State what, if any, experience you have had with paper-working machinery in general.

Ans. I have been familiar with paper-working machinery of various kinds, especially that connected with the manufacture of paper boxes and paper envelopes, and I have had occasion during the past six or eight years, to examine machines for working paper, and to examine a large number of patents relating to paper-box and envelope machinery.

Int. 4. State what, if any, knowledge you have of the state of the art of machinery for attaching stays to the corners of boxes and of kindred mechanisms?

Ans. I have examined machines and patents covering that class of mechanism, and I understand their structure and operation.

Int. 5. Have you examined and do you understand the U. S. letters patent, reissue No. 11167, granted to F. H. Beach, May 26, 1891, being the letters patent here in suit?

Ans. I have carefully examined the printed Patent Office copy of the letters patent referred to, and I understand the same.

Int. 6. Please state what you understand to be the invention set forth in the Beach patent above referred to, and especially pointed out in the first, second, third and sixth claims thereof?

54 Please answer fully, with reference to the state of the prior art, and give reasons for such answer as you may make?

Ans. The machine described in the letters patent referred to, reissue No. 11167, is a machine for attaching stays to the corners of boxes, and it is described in said patent as embodying means for pressing a strip of adhesive paper to the corner of the box, and consisting of an anvil, or lower die, upon which the corner of the box is supported, and provided with an angular face adapted to fit the inside of the corner of the box, and an upper reciprocating die

provided with an angular notch adapted to fit the outside of the corner of the box, the anvil or lower die being denoted by the letter I in the drawings, and the upper, or reciprocating die—called in the patent, a plunger—by the letter G. The strip of paper which is to be applied to the corner of the box is described and represented as a continuous strip supported upon a reel K. From the reel K, the continuous strip of paper is conducted across and in contact with a roller O, running in a well or receptacle J, and which may contain paste or other adhesive material which is carried in contact with the continuous strip by the rotation of the roller when turned by the motion of the strip of paper as it is drawn across the periphery of the roller, the roller being partially immersed in the adhesive material. From the roller O the continuous strip of paper passes over an elastic bed L, formed of a series of parallel wires 1, which are clearly shown in top view of Fig. 12 of the drawings. The feeding motion of the strip of paper is produced by a pair of rolls M, N, between which the paper passes, and which are driven with an intermittent rotary motion by means of a pinion on the spindle of the upper roll M, which is periodically engaged by a segmental or mutilated gear E 1. The upper roll M is described as being preferably roughened or corrugated, and beneath the roll the roll N is journalled in a movable block or frame N, sustained by a spring arm N, which serves to hold the roll N up against the strip of paper; the roll N has a series of circumferential grooves to receive the wires 1, and forming a series of narrow angular flanges which project upwardly between the wires 1, so as to bear upon the under side of the strip of paper. The rolls M and N, block or frame N spring arm *M* and elastic bed I form the feeding mechanism by which the continuous strip of paper is intermittently drawn over the roller O and projected forward between the anvil I and plunger G. Between this feeding mechanism and the dies G and I is interposed a cutting mechanism by which the continuous strip of paper is severed at stated intervals and a piece separated from the strip adapted to be applied to the box corner by the downward motion of the upper die or plunger G. This cutting mechanism consists of a fixed blade attached to the framework of the machine, and a pivoted blade acting in connection with the fixed blade to sever the continuous strip of paper, and actuated by a cam which at the proper time is made to impart an angular motion to the pivoted blade. The reciprocating plunger or die G is actuated by a cam and is formed in two parts capable of a sliding movement relatively to each other and having a rubber or spring interposed between them by which the lower end of the plunger is capable of slightly yielding, to render this part of the mechanism adjustable to boxes of different thicknesses. That part of the mechanism which I have just described is employed in applying the piece of paper, or other staying material, which has been severed from the continuous strip, to the outside of the box corner in severing the same from the continuous strip and in feeding the strip or drawing it off the reel and projecting it forward between the cutting blades and the pressing

dies, and it embraces all the mechanism which is concerned in claims 1, 2, 3, and 6, to which my attention has been directed. I am aware that other mechanism is shown and described, which is concerned in bending the attached strip over the edge of the box and turning it under, or within, the inside of the box, and causing it to become attached thereto. This function of the machine is performed by a secondary reciprocating plunger H moved downward by an actuating cam to carry the projecting end of the strip which has been pressed upon the outside of the box corner over the edge of the box in the position shown by Fig. 8 of the drawings, and also by a reciprocating motion which is imparted by a cam to the lower die or anvil I, and by which it is first withdrawn from the inside of the box corner, to allow the downward movement of the plunger H to turn the end of the attached strip over the edge of the box, as represented in Fig. 8, and afterwards carried forward within the box corner to push the down-turned end of the strip within the box corner and attach it to its inner side. This function of the machine and the mechanism by which it is performed, I do not understand to be involved in the present suit, nor concerned in the description of the invention as set forth in claims 1, 2, 3 and 6.

The operation of that part of the machine by which the con-
56 tinuous strip of paper is rendered adhesive, fed to the cutting and pressing devices, cut or severed into separate strips or pieces, and pressed down upon the outside of the box corner, is separate from and independent of the mechanism for turning the stay strip over the edge and within the inside of the box corner, and when so considered, the lower die or anvil I, would consist of a stationary part serving to support the box corner against the downward pressure of the reciprocating die or plunger G; and such use I deem to be clearly within the contemplation of the patent. The patent describes the lower die or anvil I, as supported upon a form B, which serves as the box support when the die or anvil I, has been withdrawn from the inside of the box corner, as shown in Fig. 8 of the drawings. This block B, as the support of the lower die or anvil I, would not be necessary if the die or anvil I, was stationary and employed to support the inside of the box corner. I have thus described, with considerable fulness, the construction and operation of the several devices for rendering the continuous paper strip adhesive; for intermittently feeding the same; for severing it into separate pieces or stay strips, and for pressing these severed pieces or stay strips upon the outside of the box corner, for the reason that I shall have occasion to refer to them specifically hereafter. It should be mentioned here, however, that the pasting, feeding and cutting mechanisms are placed at one side of the pressing mechanism, so that the end of the continuous strip of paper is projected by the feeding mechanism across the anvil or die I, sideways or at right angles to the line of its apex, instead of parallel thereto, as would be the case if the roll of paper and these intervening mechanisms just mentioned were placed at the rear of the pressing mechanism.

(Adjourned to 10 a. m. Monday, Dec. 19.)

Met, pursuant to adjournment, at 10 a. m., Monday, Dec. 19.

(Testimony of Mr. FOWLER continued:)

(Counsel for the respective parties present, as before.)

The first claim of the patent in suit describes the invention therein set forth as the combination with opposing clamping dies having diverging working faces of a feeding mechanism and a pasting mechanism, and it describes the feeding mechanism as one constructed to deliver stay strips between the clamping dies, and it describes the pasting mechanism as one for rendering the stay strips adhesive. The clamping dies are further described as being
57 so constructed as to co-operate in pressing the adhesive stay strips upon box corners interposed between the dies. This claim, therefore, contains in combination three distinct elements, first, clamping dies; second, the feeding mechanism; third, a pasting mechanism.

The second claim of the patent in suit describes the invention as the combination with opposing clamping dies provided with diverging working faces and arranged to co-operate in pressing the adhesive fastening strips upon box corners interposed between said dies, of a feeding mechanism constructed to feed forward a continuous fastening strip, and a cutting mechanism for severing the continuous strip into separate stay strips of suitable lengths.

The third claim of the patent in suit describes the invention as the combination with clamping dies provided with diverging working faces, said dies arranged to co-operate in pressing an adhesive fastening strip upon the corner of a box interposed between said dies, of a feeding mechanism constructed to feed the continuous strip, a pasting mechanism for applying adhesive substance to the strip, and a cutting mechanism for severing the strip into separate stay strips of suitable lengths.

The second claim is for a combination embracing three distinct elements: 1st, the opposing clamping dies; 2d, the feeding mechanism; 3d, the cutting mechanism.

The third claim is for a combination embracing four distinct elements: 1st, clamping dies; 2d, the feeding mechanism; 3d, the pasting mechanism; and 4th, the cutting mechanism.

The machine described in the patent in suit and in claims 1, 2 and 3, belongs to that class of box-making and paper-working machines which are constructed and arranged to work upon a continuous strip of paper which in the operation of the machine is rendered adhesive and severed into separate and suitable lengths for the particular purpose to which the paper is to be applied.

Before considering the scope of the invention described in claims 1, 2 and 3 of the patent in suit, I desire to refer briefly to other and prior machines belonging to the same class as the machine described in the patent in suit, in which the several elements which go to make up the combinations described in said claims 1, 2 and 3 are to be found, which will aid in determining the nature and scope of the invention described in said claims 1, 2 and 3 of the patent in suit.

58 I now produce a printed Patent Office copy of letters patent of the United States, No. 58466, granted to Orr & Wright October 2, 1866, in which I find shown and described a machine employing a continuous roll of paper supported upon a stand or reel, and pasted by being drawn over a roll partially immersed in adhesive material contained in a paste box or trough from the paste-roll represented at D in Fig. 1 of the drawings of said patent, the continuous and pasted strip of paper is conducted to a cutting mechanism consisting of shears, represented at F in Fig. 1 of the drawings. By this cutting mechanism the continuous adhesive strip is severed into suitable lengths to cover the paper box.

I now produce a printed Patent Office copy of letters patent of the United States No. 244,919 granted to G. Munro, July 26, 1881. The machine shown and described in this patent contains a stand adapted to hold a continuous roll of paper which is pasted by being drawn across the top of a paste-roller, shown at G in Fig. 1, adapted to revolve with the lower portion of its periphery dipping into the paste or glue contained in the box F. The continuous and pasted strip is conducted to a paper box held on a revolving form. No mechanism is shown or described in this patent for severing the continuous strip into suitable lengths to be applied to the outside of the box, but the operation of the machine obviously requires that the continuous strip, after being pasted by the pasting mechanism, must be severed.

I now produce a printed Patent Office copy of letters patent of the United States No. 253,711, granted to H. Inman, February 14, 1882. This patent also shows and describes mechanism adapted to work upon and paste a continuous roll of paper held upon a reel shown at D, Fig. 1 of the drawings. The continuous strip of paper is carried over and in contact with a roll F, turning in a paste-tank E, and by which paste or glue is applied to the under surface of the continuous strip as it is drawn forward and applied to the outside of a paper box held upon a revolving form D.

I now produce a printed Patent Office copy of letters patent of the U. S. No. 298,879, granted to G. Munro, May 20, 1884, which shows a pasting mechanism arranged and adapted to render a continuous strip of paper adhesive, similar in its essential features, with that shown in the prior patent to G. Munro, and already referred to.

I now produce a printed Patent Office copy of letters patent No. 306,836, granted to A. Kingsbury, October 21, 1884, which
59 shows and describes a reel for supporting a continuous roll of paper, a paste-tank, a paste-roll, partially immersed in adhesive material which is carried into contact with the under side of the continuous paper strip. The continuous strip is drawn off the reel, across and in contact with the paste-roll, and cut into desired lengths by a pair of shears.

I now produce a printed Patent Office copy of letters patent of the U. S., No. 299,225, granted to H. Inman, May 27, 1884. This patent shows and describes a machine arranged to work upon a continuous strip of paper, and it contains a pasting mechanism con-

sisting of a paste-tank or glue box, a roll partially immersed in the adhesive material contained therein, and a reel for supporting the continuous strip of paper wound in a roll. The paper to be pasted is drawn off the reel across the top of the partially immersed roll, which is turned by the motion of the paper. The machine shown and described in this patent contains a cutting mechanism by which the continuous and pasted strip is severed into suitable lengths to cover a portion of the box supported upon a box form.

These several patents to which I have just referred represent, in part, the prior state of the art with reference to the mechanism employed to apply adhesive material to one side of a continuous strip of paper, and they show it to be a well-known method to support the continuous strip of paper wound into a roll, upon a reel, and to draw the continuous strip across and in contact with the top of a roll capable of being rotated by the forward movement of the paper strip, said roll having its lower portion immersed in some adhesive material contained in a suitable receptacle.

I now produce a printed Patent Office copy of letters patent of the U. S., No. 281,958, granted to Beecher & Elliott, July 24, 1883. This patent shows and describes a machine for making boxes from a continuous strip of paper-box material. It shows and describes a standard adapted to support a roll of pasteboard in such manner as to permit the same to revolve when the end of the continuous strip is taken by the machine. It shows and describes mechanism by which glue or adhesive material is applied to the continuous strip. It shows and describes a mechanism by which the continuous strip is fed, or drawn off the roll and projected forward to the cutting and pressing mechanism. This feeding mechanism is described as consisting of a pair of rolls, G and H, to which an intermittent movement is given by means of a bevel-gear wheel on the shaft of the upper feed-roller G, and a segmental or mutilated gear on the main driving shaft. The feed-rolls G and H are represented in Figs. 10 and 11 of the drawings, and the driving pinion and mutilated gear are represented in Fig. 2.

By the movement of these feed-rollers the continuous strip is drawn from the roll by the mechanism for applying the glue, which is placed between the feeding mechanism and the continuous roll, and projected forward to the severing and box-forming mechanism. The box-forming mechanism contains a bed block located in a proper horizontal plane to receive the blank at the end of the strip as it is delivered thereto by the intermittent action of the feed-rollers. Above this bed block is a reciprocating plunger described in the patent as a former block. The former block and the bed block constitute a pair of opposing clamping dies between which the blank is pressed and held. The blank is partially severed between the clamping dies and the feed-rolls, by the action of cutting blades, and the complete separation of the blank from the continuous strip is effected by the action of the box-forming mechanism itself.

In the machine shown and described in the patent No. 281,958, granted to Beecher & Elliott, and just referred to, I find in combination, first, a pasting mechanism by which adhesive material is

applied to a continuous strip of paper, or box material; second, a feeding mechanism having an intermittent motion by which the continuous strip to which the adhesive material has been applied is drawn off the roll and projected forward to the cutting and box-forming mechanisms; third, a cutting mechanism by which the continuous strip is cut or scored so as to be readily separated by the box-forming mechanism; and fourth, a pair of opposing clamping dies adapted to exert a pressure upon the severed blank. I am aware that additional mechanisms are embraced in the machine, for example, a mechanism for folding the box; but such mechanism is entirely independent of, and in no manner modifies or affects the combination of gluing, feeding, cutting and clamping mechanisms to which I have just alluded.

I now produce a printed Patent Office copy of letters patent of the U. S. reissue No. 6245, granted to F. Gates, January 19, 1875. This patent shows and describes a machine for making paper boxes in which the material is presented to the machine in the form of a continuous strip wound upon a roller represented at G in Fig. 4 of the drawings. In front of the roller G is placed a pasting or gumming mechanism by which the continuous strip is pasted as it is
61 drawn from the roller. In front of the pasting mechanism is located the feeding mechanism, consisting of a pair of rollers H, H, said rollers having an intermittent rotary motion by which the continuous strip is drawn off the roller G, and by the pasting mechanism.

By the intermittent action of the feed-rollers the continuous strip is projected forward to the cutting mechanism, consisting of a cutting blade S, which is brought down and separates the end of the paper from the continuous roll.

The piece severed by the action of the cutting blade S, is clamped or pressed between a reciprocating plunger P, and a follower Q, which hold the blank during the operation of the box-folding mechanism.

In this patent. No. 6245, to Gates, I find in combination, 1st, a pasting mechanism by which adhesive material is applied to a continuous strip of paper or box material; 2d, a pair of feed-rollers having an intermittent rotary motion by which the continuous strip is drawn past the pasting mechanism and projected forward to the cutting mechanism; 3d, a cutting mechanism by which a piece is severed from the continuous strip; and 4th, a pair of opposing clamping dies between which the severed strip is pressed.

A similarity may be noticed in passing between the feeding mechanism shown and described in patent No. 6245 and the feeding mechanism described in the patent in suit, to wit: That they both embody a pair of feed-rollers provided with circumferential grooves forming flanges, and they both show parallel wires contained in the grooves of the feed-rollers and over which the strip of paper is moved.

(Recess for one hour.)

Referring to Defendants' Exhibit Sawyer 1875 Patent, and to the Sawyer 1875 model, I find in said patent and said model a machine provided with means, first, for rendering a continuous strip of paper adhesive; 2d, means for feeding the adhesive continuous strip with an intermittent motion and projecting the same between a pair of opposing clamping dies; 3d, with means for severing the continuous strip; and 4th, a pair of opposing clamping dies for pressing the piece which has been severed from the continuous strip, and attaching the same to a tag or other plain surface interposed between the clamping dies; and I find in this patent the combination of mechanisms for rendering the strip adhesive; feeding the continuous strip intermittently; severing the strip and pressing
62 the separated piece upon the work to which it is to be attached by the action of reciprocating clamping dies.

In the Sawyer 1875 patent I find present the combination of elements set forth in claims 1, 2 and 3 of the patent in suit, with the single exception that the opposing clamping dies shown in the Sawyer patent have plain faces in order to adapt them to the particular work for which they are designed, instead of having diverging working faces, which would adapt the machine described in the Sawyer patent to the work of applying the severed adhesive strip to the corner of the box.

In my opinion, the combination of the pasting, feeding, cutting and clamping mechanisms constructed and operating as shown and described in the said Sawyer 1875 patent, and in the said Sawyer 1875 model, would be adapted to perform the functions of the combination set forth in each of the claims 1, 2 and 3, of the patent in suit, provided the faces of the clamping dies in the Sawyer machine were made to conform to the shape of a box corner.

If the faces of the clamping dies in the Sawyer machine were so changed, the description of the invention as set forth in claims 1, 2 and 3 of the patent in suit, would describe with accuracy the combination then present in the Sawyer machine.

What I have said with reference to the Sawyer machine can also be said with reference to the machines shown and described in the patent to Beecher & Elliott, and in the patent to Gates; or in other words, the combination of the pasting, feeding, cutting and pressing mechanisms, substantially as shown in said patents, and combined, arranged and co-operating substantially as shown in said patents, would form a mechanism which would be accurately described by the description set forth in claims 1, 2 and 3 of the patent in suit, provided the pressing mechanism shown in said patents were adapted in size and shape, to adapt their faces to the configuration of a box corner.

I now produce a printed Patent Office copy of letters patent of the U. S. reissue No. 1212, granted to E. Waters, July 9, 1861, in which I find shown and described a machine for making paper boxes, provided with opposing clamping dies having diverging working faces by which the opposing faces of the dies are made to fit the outer and inner sides of the angular box corner. In my opinion, it would not have required invention to substitute angular

dies such as are shown in the said Waters patent, for the plain
63 clamping dies shown in the patents to Sawyer, Gates, and Beecher & Elliott.

I am aware that the relative position of the two clamping dies shown in the patent in suit is different from that shown in the patent to Waters, in that the male die in the patent in suit is made the stationary die, while in the patent to Waters it is made the reciprocating die; but this change I do not consider material, or one requiring invention.

I now produce a printed Patent Office copy of letters patent of the U. S., No. 148,416, granted to J. Cohn, March 10, 1874, for a machine for inserting corner clasps of boxes. In the machine shown and described in this patent, I find a lower stationary die or anvil upon which the corner of the box is supported, and an upper reciprocating die or plunger by which a stay piece, or corner clasp, is attached to the outside of the box corner, said dies having diverging working faces constructed to co-operate in pressing upon interposed box corners, a corner clasp or stay piece.

The corner clasps or stay strips are applied to the interposed box corner by the pressing action of the upper or reciprocating die, and so far as the pressing action of the dies is concerned, their operation is precisely like the operation of the clamping dies shown and described in the patent in suit.

In view of the state of the art at the record date of the patent in suit, I am of the opinion that no invention would be required in adding to a combination of pasting, feeding and cutting mechanisms, a pair of clamping dies having diverging working faces, or in so placing and arranging such a pair of clamping dies in proper relation and juxtaposition to the pasting, feeding and cutting mechanisms, as would enable them to receive an adhesive stay strip, for the reason that it was old and well known to so combine pasting, feeding, cutting and clamping, or pressing mechanisms in a single machine, so they would co-operate in acting upon a continuous strip of paper; and it would involve no invention to simply change the shape of the dies to adapt them to the shape of the box corner.

I am confirmed in this view by a reference to the file-wrapper and contents of the original patent, No. 447,225, and of which the patent in suit is a reissue.

I hereby produce a certified copy of said file-wrapper and contents, in which I find that by applicant's amendment of May 4, 1886, claim 1 was amended as follows: "1st. In a machine for
64 attaching stays to boxes the combination of a form of angular shape presenting a corner to receive the corner of the box, and a plunger provided with a corresponding angular notch which fits the form and pastes the stay to both angular sides of the box and over its apex, as described."

This claim, by office letter of September 3d, 1886, was rejected upon reference to the patent of Cohn, 148,416, to which I have referred.

The description of the invention set forth in claim 1 of the patent in suit, in my opinion, is for an inoperative combination, for the

reason that it does not include any cutting mechanism by which the single and separate stay strips adapted to be applied to the box corner can be separated from the continuous strip of adhesive paper.

The patent in suit does not show and does not describe any mechanism by which a series or succession of individual stay strips can be fed to the clamping mechanism; and a feeding mechanism adapted to feed such a series of individual strips would involve a mechanism entirely different from anything shown or described in the patent in suit, which would require invention.

Even if such a feeding mechanism were known and could be adapted to the purposes of the machine shown in the patent in suit, it could not co-operate with the pasting mechanism therein shown and described, for the reason that the pasting mechanism therein shown requires for its operation, a continuous strip, and is not capable of rendering a series of individual and separate stay strips adhesive.

I am confirmed in my view that the combination set forth in claim 1 is inoperative, by a further reference to the file-wrapper and contents of the original patent, and in which I find that claim 1, filed November 10, 1886, and which was as follows: "First, in a machine for attaching stays to boxes, the combination of a form of angular shape to receive the corner of the box, a plunger provided with a corresponding angular notch which fits the form to paste the stay to both sides of the box, and a pasting apparatus that pastes one side of the stay before it reaches the form, as set forth," was amended November 23, 1886, by inserting the words "substantially as described," after the words "and a pasting apparatus."

This claim, so amended, I find to have been rejected by office letter of January 28, 1887, on the ground that the combination in said claim was incomplete, and that it should include as elements both the feeding and cutting mechanisms, substantially as described.

This action on the part of the office, I find to have been acquiesced in by the amendment filed by applicant March 5, 1887.

But assuming that the combination set forth in claim 1 were operative, said claim would not, in my opinion, describe a combination involving invention over what was known in the prior state of the art, for the reason that it was not new at the record date of the patent in suit to combine in a single machine clamping dies, a feeding mechanism and a pasting mechanism; neither did it require invention to substitute for clamping dies having plain faces on other and known form of clamping dies having diverging faces so constructed as to co-operate in pressing an adhesive stay strip upon a box corner.

The invention described in claim 1 consists, in my opinion, of the combination of separate and specific elements, and the invention inheres in the novel and specific construction so far as it may be found to exist in the several elements enumerated in said claim.

Such invention would be expressed by inserting the words "sub

stantially as described" after the enumeration of each element men tioned in said claim.

For the same reasons the invention set forth in claim 2 is not broadly, for a combination of opposing clamping dies having diverg ing working faces and arranged as described; a feeding mechanism constructed to feed a continuous strip, and a cutter for severing said continuous strip, for such combination was not new at the record date of the patent in suit; but the invention described in said claim 2 inheres in the novel and specific construction and arrangement of the separate and specific elements as would be expressed by insert ing the words "substantially as described" after the enumeration of each of the elements mentioned in said claim.

The invention described in claim 3 is not, broadly, a combination of the opposing clamping dies having diverging working faces and arranged to co-operate in the manner described; a feeding mechanism constructed to feed a continuous strip between the dies a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strip into stay strips of suitable lengths, for these several elements had been so combined before, with the single exception that these prior combinations had simply required the change in the form of the clamping dies, which would adapt them to a box corner.

66 The invention described in claim 3, as in the other two claims I have noticed, inheres in the novel construction and operation of some one or more of the specific elements such as would be expressed in terms by the insertion of the words, "substantially as described," after the enumeration of each of the elements named in said claim.

(Adjourned to 9.30 a. m., Tuesday, Dec. 20.)

Met, pursuant to adjournment, Tuesday a. m., same parties present as before.

I am confirmed in my view that the invention sought to be described in claims 1, 2 and 3 of the patent in suit would properly be described by the insertion of the words, "substantially as described," after the enumeration of each and every one of the elements forming the combinations mentioned in said claim, by the action at the Patent Office, as disclosed by the certified copy of the file, wrapper and contents of the original patent of which the patent in suit is the reissue.

By referring to said copy of the file-wrapper and contents, I find that the examiner, by office letter of December 26, 1890, said: "The broad term 'mechanism' in claims 1, 2, 3 and 7 should be qualified by some such expression as 'substantially as described.'"

I also find that in response to said office letter the applicant used the following language: "All formal amendments called for have been made, except the insertion of the words 'substantially as described.' The insertion of these words is not objected to because they will necessarily change the scope of the claim, but because they will involve a useless repetition of said words in the claim.

is perfectly clear that the words 'substantially as described' found at the end of each claim refer to each and every part mentioned in the claim, so that the repetition of these words after several of the descriptive clauses will in no sense change the meaning, which will be exactly the same whether the words mentioned are repeated after the clause describing each element or are placed at the end of the claim only to apply to all."

I am not unmindful of the fact that the combination of elements as described in said claims 1, 2 and 3 is made under certain conditions and restrictions as expressed in said claims.

For example, the opposing clamping dies are constructed with diverging working faces, and are also so constructed as to co-operate in pressing adhesive fastening strips upon interposed box corners.

67 The feeding mechanism is constructed to deliver stay strips between said clamping dies in said claim 1 and is so constructed to feed a continuous fastening strip in said claims 2 and 3.

The delivery of the stay strips by the feeding mechanism referred to in claim 1 and its co-operation with the pasting mechanism therein referred to requires a continuous stay strip, and therefore, it is my opinion that the modifying condition in claims 1, 2 and 3 alike is, that the feeding mechanism shall be so constructed as to feed forward a continuous fastening strip.

The cutting mechanism is one adapted for severing the continuous fastening strip into stay strips of suitable length.

The pasting mechanism is one adapted to render one side of the continuous fastening strip adhesive.

These several conditions and these separate and several functions were all present in the prior machines to which I have referred.

The clamping dies have diverging working faces and are constructed to co-operate in pressing the adhesive stay strips upon the interposed box corners in the same way and in the same manner as the angular dies shown in the patent to Waters, and in the patent to Cohn, already referred to.

Moreover, it was a well-known expedient to apply adhesive stay strips to other work than box corners, by the means of clamping dies having plain faces, as is shown in the patent to Sawyer and in the Sawyer 1875 model.

Clamping dies having plain faces and constructed to co-operate in pressing an adhesive strip upon plain work being known at the record date of invention of the patent in suit, it would not, in my opinion, require any invention to change the configuration of the dies to suit work of different shapes, as this expedient is one well known and commonly practiced in die presses for stamping sheet metal, pressing leather, and various other purposes. The arrangement of the feeding mechanism in the combination, and as a part thereof, so it will be capable of feeding forward a continuous fastening strip and projecting the end of the strip periodically between a pair of clamping dies, did not require invention, for the reason that this condition was present and this function was performed by the feeding mechanism, and in substantially the same combination, in

the patents to Beecher & Elliott, to Gates, and to Sawyer, and is also found in the Sawyer 1875 model.

A cutting mechanism adapted to sever the separate and individual stay strips from a continuous strip and acting in combination with the other elements named, to wit: pressing, feeding and pasting mechanisms, is found in the patents to Beecher & Elliott, to Gates, and to Sawyer, and also in the Sawyer 1875 model.

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The pasting mechanism shown and described in the patent in suit is an old and well-known method of applying adhesive material, or for rendering adhesive one side of a continuous strip of paper, as disclosed by the prior state of the art from the patent to Orr & Wright in 1866, to which I have referred, down to the patent in suit.

And the combination of all these elements, each performing the same function as performed by the machine described in the patent in suit, is found in the patent to Beecher & Elliott, to Gates and to Sawyer, and also in the Sawyer 1875 model. The combination in said patents requiring only such minor and incidental changes as would clearly fall within the province and ability of a mechanic skilled in the art to make.

The patent to Sawyer shows in combination the several elements enumerated in claims 1, 2 and 3 of the patent in suit, and in my opinion, it would not require invention to make such changes as would adapt the machine shown in said patent to perform the function of pressing adhesive stay strips upon a box corner interposed between the clamping dies.

I find present in said Sawyer machine the opposing clamping dies constructed to co-operate in pressing an adhesive stay strip upon interposed work; a feeding mechanism "constructed to feed forward a continuous fastening strip," and also "constructed to deliver stay strips between said clamping dies," and also "constructed to feed between the dies a continuous fastening strip." I find further in said Sawyer machine, and in combination with these clamping dies and this feeding mechanism, a cutter "for severing the said continuous strip into stay strips of suitable length," and I also find in combination with these clamping dies this feeding mechanism and this cutter, a mechanism "for rendering adhesive the stay strips."

I also find a supporting form upon which the work rests, and by which it is supported while the adhesive stay strips are being applied; said work-support corresponding in its nature, position, and function, with the work-support shown and described in the patent in suit and therein designated as "Form B." This supporting form presents, in one case, a plain surface to support the work, and in the other an angular surface, for the reason that in one case the work to be supported is a plain sheet of tag material, and in the other case, of angular form; but such change, which is suggested by and determined by the character of the work, would, to my mind, obviously fall within the province and skill of an ordinary mechanic.

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I also find in said Sawyer machine, as in the patent in suit, the clamping dies to consist of a pair of plungers having a reciprocating motion. It is true that in the patent in suit the lower die moves in a line at right angles with the line of motion of the upper die, but this change is one required in order to enable it to perform the additional function of turning in the end of the stay strip.

The dies in both machines, however, reciprocate, and the under die in both machines is carried under and beneath the interposed work at the moment that the pressure is applied to the stay strip by the upper die, so that the lower dies in both machines will serve as an anvil or support for the interposed work at the moment at which pressure is applied.

In both the Sawyer machine and in the machine described in the patent in suit these clamping dies are arranged in the same relative position to the feeding mechanism and in the proper plane to receive the work, and also to receive the end of the adhesive strip as projected forward by the feeding mechanism; and if the dies in the Sawyer machine were made angular, so as to fit the angular form of the box corner, they would press an adhesive stay strip upon a box corner in the same manner as they press the adhesive stay strip upon the surface of the tag, as described in said Sawyer patent.

The cutting mechanism in the Sawyer machine, as in the patent in suit, performs the function of severing the continuous strip into a stay strip of suitable length. It is placed between the clamping dies and the feeding mechanism and it performs its function after the continuous strip has been projected forward between the clamping dies, and before the faces of the clamping dies are brought into contact, in the same manner as the cutting mechanism of the patent in suit.

The feeding mechanism in the Sawyer machine, like the patent in suit, has an intermittent motion by which the end of the continuous strip is projected between the clamping dies and the cutting mechanism and over the side of the work interposed between the clamping dies, and in proper position to be attached thereto and at that period of time at which the cutting mechanism and the clamping dies are prepared to receive it, in exactly the same manner as the feeding mechanism described in the patent in suit.

The intermittent motion of the feeding mechanism also serves in the Sawyer machine, as in the patent in suit, to draw the continuous strip over the mechanism by which said strip is rendered adhesive.

The mechanism for rendering the stay strap adhesive is described in the Sawyer patent as consisting of a pair of heating boxes L and M, by means of which the gum previously placed upon the continuous strip is melted or rendered adhesive. Said Sawyer patent, however, refers to and contemplates the employment of sponges to moisten the gum and render the strip adhesive by moisture. The same method of rendering the stay strip adhesive by the use of water applied to a strip previously gummed is referred to in the patent in suit, lines 18 to 22, page 4.

The employment in the Sawyer machine, or in the machine shown

and described in the patent in suit, of a pasting mechanism consisting of a reel support to hold the continuous roll of paper, a paste-tank to hold the adhesive material, and a paste-roll with its lower portion immersed in the adhesive material and turned by the motion of the continuous strip drawn across and in contact with its upper edge, would not require invention and would be simply the aggregation in a machine of a common and well-known form of pasting mechanism which had long been known and used and had also been employed in combination with a pair of feed-rolls having an intermittent motion, as shown in the patent to Gates already referred to.

I am, therefore, clearly of the opinion, in view of the prior state of the art, that the invention described in said claims 1, 2 and 3 of patent in suit, if invention there be, is coextensive with the statement and description contained in said claims only when the words "substantially as described" are understood and made to refer specifically to each and every one of the different elements enumerated in said claims.

Claim 6, to which my attention has been directed, is for "the combination of opposing clamping dies having diverging working faces constructed to co-operate in pressing an adhesive stay strip upon an interposed box corner, one of said clamping dies being constructed to act with an elastic or yielding pressure to enable the dies to operate upon box corners of different thicknesses, substantially as described."

I find in the description of the invention contained in said sixth claim no statement whatever of any element, feature, function or peculiarity of operation which was not well known and commonly practiced at the record date of invention of said patent in suit.

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I have already considered the two conditions mentioned in said claim 6, namely, the peculiar shape of the working faces, and the fact that the dies are constructed to co-operate in pressing an adhesive stay strip upon an interposed box corner; and what I have already said with regard to these two features and with reference to claims 1, 2 and 3, I deem equally applicable to the consideration of the statements contained in claim 6; and I will, therefore, now, only consider that feature of the invention as described in said claim 6, which relates to the construction of the clamping dies, or one of them, so as to permit them to act with an "elastic or yielding pressure, to enable the dies to operate upon box corners of different thicknesses, substantially as described."

This feature is a common and well-known expedient and has long been known and employed in die presses of various kinds employed in pressing sheet metal, and especially in die presses employed in pressing and shaping leather.

I now produce a printed Patent Office copy of letters patent of the United States, No. 206,145, granted to A. F. Smith, July 16, 1878. This patent shows and describes a machine which embodies a stationary die and a reciprocating die acting in conjunction there-

with to press a piece of leather interposed between said dies, and shape the same into the form of a heel-stiffener.

In this machine, as in a great majority of machines of this class, it becomes necessary to provide for the variation in the thicknesses of the different pieces of leather to be operated upon; and this is accomplished by placing beneath the lower or stationary die, represented at C in Fig. 1, an elastic cushion *c*, which is interposed between said lower die and the supporting bed or framework of the machine, so as to allow the die to yield beneath the pressure applied to its face. A similar elastic cushion is also interposed between the reciprocating die B, and the slide or carriage D, thereby allowing the reciprocating die to yield, so as to accommodate itself to counter-blanks of different thicknesses.

The patent to Smith, above referred to, shows it to have been an old, well-known expedient in 1878, to render either one, or both of of the dies in a press capable of acting "with elastic or yielding pressure."

I now produce a printed Patent Office copy of letters patent of the United States, No. 105,030, granted to H. H. Bigelow,
72 July 5, 1870, for pressing heel blanks, in which Fig. 5 of the drawings shows a heel blank supported by a bed piece Y, having a spring Y^1 of rubber or some other suitable material arranged beneath and supporting the bed piece Y, allowing the bed piece to yield slightly beneath a downward pressure applied upon the upper surface of the heel blank.

I now produce a printed Patent Office copy of letters patent of the United States, No. 64176, granted to M. Wells, April 23, 1867, for a die press, in which is shown in sectional view in Fig. 2 of the drawings, a lower die F, and an upper angular clamping die G, arranged to co-operate with the lower die in clamping a piece of sheet metal interposed between them. The upper die G, is secured to a cross-bar H, which is free to rise and fall within certain limits "Springs *d* bear on the upper surface of the cross-bar and render the same yielding, so that the clamp can adjust itself to blanks, being thicker on one side than on the other, or to blanks of different thicknesses. Said springs are made of India rubber, or other suitable material."

I now produce a printed Patent Office copy of letters patent of the United States, No. 138,721, granted to Wilson & Miller, May 6, 1873, which shows and describes an arrangement of clamping or pressing dies constructed to act with an elastic or yielding pressure, and representing in the drawings an operating upper die A, and carrying "spring-borne plunger *b*," arranged to press upon the blank with a yielding pressure.

I now produce a printed Patent Office copy of letters patent of the United States, No. 250,255, granted to E. Jordan, November 29, 1881, in which Fig. 2 of the drawings shows an annulus *f*, held within the lower die C, and supported upon an elastic spring N, allowing the annulus to yield under pressure.

I now produce a printed Patent Office copy of letters patent of the U. S., No. 240,561, granted to W. St. Hilaire, April 26, 1881, in

which the drawings show a guide-block F, arranged to receive the pressure exerted by the machine in the operation of shaping a heel-stiffener; said guide-block being held to its place by a strong spring H, which "keeps the block motionless under all ordinary pressure, but will yield sufficiently to prevent refractory material from being injured when its thickness causes extraordinary strain."

I also produce a printed Patent Office copy of letters patent of the U. S., No. 286,432, granted to J. L. Hatch, October 9, 1883, in which the drawings show in Figs. 1 and 2, a heel form A,
73 constituting a lower or stationary die, and having a spring b^1, interposed beneath the heel form and the framework of the machine, allowing the heel form to yield under the pressure applied by the reciprocating follower D.

The machine described in the patent to Hatch, No. 286,432, and also the machine described in the patent to Smith, No. 206,145, show opposing clamping dies having their faces so formed as to fit the work to be pressed between them, and having their working faces "diverging" or otherwise, as the work to be performed may determine; and they are constructed and arranged to co-operate in the same manner as the clamping dies shown and described in the patent in suit; and they are constructed to act with an elastic or yielding pressure, to accommodate themselves to material of different thicknesses interposed between them.

I find in Defendants' Exhibit Glazier Box Press, the same feature present, namely, clamping dies, one of which is constructed to yield so as to exert an elastic or yielding pressure.

This machine shows a lower stationary die upon which the article to be pressed is placed, and a reciprocating die carried by a cross-head. The upper die and cross-head are brought down by a pair of connecting rods at each side of the machine, actuated by a foot treadle and toggle joint. The cross-head is held between nuts on the connecting rods, and elastic washers are interposed between the cross-head and the upper nuts, so as to allow a slight yielding movement of the cross-head as the pressure is applied.

The feature of the alleged invention forming the essential feature of claim No. 6, viz, the construction of a clamping die so as to exert an elastic or yielding pressure, I find to be clearly shown in the several patents to which I have referred, and was, moreover, commonly employed for many years prior to the record date of the invention described in claim 6 of the patent in suit.

(Adjourned to 2.30 p. m., Dec. 20.)

Met, pursuant to adjournment, at 2.30 p. m., same parties present as before.

I will, however, refer to a few machines analogous in their purpose and mode of operation to the machine described in the patent in suit, in order to show that this feature of so constructing clamping dies as to exert an elastic or yielding pressure, was a well-known device in that class of machines.

Referring to the patent to Cohn, No. 148,416, I find that the bed

G, or form upon which the box corner was supported, rested
74 upon and was secured to a spring bar *d*, which allowed the bed G, to yield under pressure as the plunger K descended.

In the patent to Beecher & Elliott, No. 281,958, I find that the bed block *i*, was supported upon a rod i^1, having a coiled spring surrounding the rod, with its lower end bearing upon a table below, and its upper end against the bottom surface of the bed block. By means of this construction the bed block *i* was adapted to yield in a downward direction, as indicated in Fig. 26 of the drawings, when pressure was brought to bear upon it, by the reciprocating plunger or former block, and causing an elastic or yielding pressure to be exerted upon the box blank inserted between the clamping dies, consisting of the former block and bed block.

Referring to the patent to Gates, reissue No. 6245, I find that the continuous strip of paper or box material was projected between a pair of clamping dies consisting of the plunge. P and follower Q, and that the follower Q, forming the lower of these dies, was held up by a spiral spring which allowed a yielding pressure to be exerted upon the box blank held between the plunger and follower.

By means of these instances, and others which could be adduced, I think it is clear that it was not new in machines of this class, to so arrange a pair of clamping dies with "one of said clamping dies being constructed to act with an elastic or yielding pressure."

An elastic or yielding pressure exerted upon a box corner, in my opinion, is of precisely the same nature and character, and the result is the same in kind, as it would be were the yielding pressure exerted upon other material.

And I may here state that the function produced by the combinations described in claims 1, 2 and 3 of the patent in suit is the same in its nature and character as that produced by the similar elements when combined, as shown in the patents to Beecher & Elliott, No. 281,958; to Gates, reissue No. 6245; and to Sawyer, No. 166,940; and that the result produced by each of the elements enumerated in said claims 1, 2 and 3, is exactly the same in kind as the result produced by each of the corresponding elements found in said patents to Beecher & Elliott, to Gates and to Sawyer.

Also that the result produced by the combination of the several elements as described in said claims 1, 2 and three of the patent in suit, is the same in kind as the result produced by the combination of the same elements in the machines shown and described in the patents to Beecher & Elliott, to Gates and to Sawyer, referred to.

Referring to patents No. 208,286 to Brewer, September 24,
75 1878, and No. 226,086 to C. Leib, March 30, 1880, printed Patent Office copies of each of which I now produce, it will be found that an angular form, or work-support, or one having diverging working faces, was a well-known device prior to the record date of invention of the patent in suit, both of these patents showing an angular support upon which the work is supported in machines for stitching books.

The patent to Wells, 64176, April 23, 1867, to which I have al-

ready referred, can also be cited as showing that a special configuration or shaping of the working faces of opposing dies to suit the character, nature and desired shape of the work to be pressed, was a well-known expedient long before the date of the alleged invention as described in the patent in suit.

Counsel for defendants offers in evidence the following exhibits:

Machines and Specimens.

Glazier box press.
Sample box.
Sample box end.
Defendants' patent No. 442,582 to J. A. Horton, Dec. 9th, 1890.
Horton's brush dies.
Horton's original machine.
Sawyer's 1875 patent.
Sawyer's 1875 model.
Dennison tag machine.
Label patch strip.
Illustrative tag.
Hobbs' modified machine.
Hobbs' machine No. 2.

Patents.

Orr & Wright, 58466, Oct. 2, 1866.
Munro, 244,919, July 26, 1881.
Inman, 253,711, Feb. 14, 1882.
Munro, 298,879, May 20, 1884.
Kingsbury, 306,836, Oct. 21, 1884.
Inman, 299,225, May 27, 1884.
Beecher & Elliott, 281,958, July 24, 1883.
Gates, R. 6245, Jan. 19, 1875.
Waters, R. 1212, July 9, 1861.
Cohn, 148,416, March 10, 1874.
76 Smith, 206,145, July 16, 1878.
Bigelow, 104,030, July 5, 1870.
Hatch, 286,432, Oct. 9, 1883.
Wells, 64176, April 23, 1867.
Wilson & Miller, 138,721, May 6, 1873.
Jordan, 250,255, Nov. 29, 1881.
St. Hilaire, 240,561, April 26, 1881.
Brewer, 208,287, Sept. 24, 1878.
Leib, 226,086, March 30, 1880.
Certified copy of Hadden's English patent, No. 16137 of 1884.
Certified copy, file-wrapper and contents Beach's original patent No. 447,225.
Certified copy Beach's original and supplementary drawings in No. 447,225.
Certified copy of file-wrapper and contents of Beach's reissue patent in suit, No. 11167.

Int. 7. Assume that Defendants' Exhibit Dennison Tag Machine antedates the invention of the patent in suit, and state what, if any bearing it has, in your opinion, on the construction of claims 1, 2 and 3 of said patent?

Ans. I find in the exhibit referred to a pair of feed-rolls, the shaft of one of said rolls being provided with a ratchet wheel engaged by a pawl by which an intermittent rotary motion can be imparted to the rolls. I find said machine to contain a pair of stationary cutting dies arranged in the plane of contact of said rolls, and also a pair of plungers capable of a reciprocating motion and having cutting edges which act in conjunction with the stationary cutting dies, and which in the operation of the machine would cut a circular disk from a continuous strip fed to the cutting dies by the intermittent rotation of the rolls. I find that the reciprocating plungers are provided with opposing and plane faces which are capable of pressing work interposed between the two stationary cutting dies which are left far enough apart to allow a strip of tag stock or material to pass between them. Two continuous strips of staying material are passed, one above the upper of the stationary cutting dies, and the other beneath the lower of the stationary cutting dies, and between the rolls. In the operation of the machine I understand that these strips are rendered adhesive by a suitable device, and that the reciprocating motion of the two plungers as they pass through the stationary cutting dies, sever a patch or disk from each of the
77 strips and carry them against the tag inserted between the two stationary cutting dies, and with the adhesive side of the patches next the tag to which they are made to adhere firmly by the pressure of the two reciprocating plungers which pinch the two patches and intermediate tag between their opposing ends. Upon the upward movement of the reciprocating plungers the two adhesive and continuous strips are fed forward by the intermittent rotation of the rolls I have referred to, and a new tag moved into proper position to receive the succeeding pair of patches.

This machine in its operation embodies in combination, first, a pair of opposing clamping dies; second, a feeding mechanism by which the continuous strip is fed or delivered to the clamping dies; third, a cutting mechanism by which the patches are severed from the continuous strip, and in the operation of the machine, but which is not shown in the exhibit, some device by which the continuous strips are rendered adhesive.

This combination is substantially the same as that shown in the Sawyer 1875 model, so far as the operation of the separate elements and the result produced by the combination is concerned; and like the Sawyer 1875 model, the combination is substantially the same as the combination described in claims 1, 2 and 3 of the patent in suit. The result of the combination of the Dennison tag machine being the same in kind, and the function of the separate elements being the same in kind, as the combination described in claims 1, 2 and 3 of the patent in suit, and of the elements contained therein.

Int. 8. Please look at the machine now shown you and offered in evidence and marked "Defendants' Exhibit Hobbs Modified,

W. K. B., Jr., spec'l ex'r," and state what, if any material and substantial difference there is between it, in your opinion, and the Sawyer 1875 model, so far as the combination of gumming, feeding, severing and pressing mechanism are concerned?

(Question objected to as wholly immaterial and irrelevant. The exhibit is also objected to as wholly immaterial, irrelevant, and all allusion to the testimony given, bearing upon the machine now offered in evidence is timely objected to as wholly immaterial, irrelevant, which objection is intended to apply to all questions and answers hereafter given pertaining to such exhibit, without further notice.)

Ans. I have examined the machine marked "Defendants' Exhibit Hobbs Modified," and I find embodied therein the same combination of elements as are embodied in the Sawyer 1875
78 model. I find, 1st, a device for rendering a continuous strip of paper adhesive; 2d, a feeding mechanism by which it is fed to and delivered between a pair of opposing clamping dies; 3d, a cutting mechanism by which a certain part or piece of the continuous strip is severed therefrom, and a pair of clamping dies adapted to press the severed strip upon a piece of work interposed between said clamping dies; and if such interposed work were a tag, the severed piece cut from the continuous strip would be pressed upon and attached to said tag, in the same manner as it would be by the action of the reciprocating plungers shown in the Sawyer 1875 model, for the reason that the clamping dies shown in Defendants' Exhibit Hobbs Modified are provided with plain working faces adapted for the purpose to which I have referred, viz., for pressing an adhesive stay strip upon the tag; there-, in my opinion, the combination and the result produced by the combination is substantially the same as the combination of the similar elements in the Sawyer 1875 model.

Int. 9. Please indicate on Defendants' Exhibit Sawyer 1875 Model, by marking the same, what, if any portion, would have to be removed, in order to convert the same from a machine for pressing stay strips on flat stock into a machine for putting the stay strips on box corners or other irregularly shaped stock.

(Objected to as leading and improper.)

Ans. That change would require to be made, which I have already indicated in my testimony regarding the machine shown and described in the Sawyer 1875 patent, viz., a change in the support from a flat surface for supporting the tag to an angular surface for supporting the box corner, and a change in the shape of the opposing faces of the plungers from a flat surface to an angular surface, or surfaces having diverging working faces. I have marked in pencil upon the upper plunger the shape of the V-shaped notch which would be required, and I have marked roughly upon the lower plunger the shape of the angular face which would be required, and I have also marked in pencil upon the lower block

through which the lower plunger passes, the form which would be required to correspond to the form B, shown in the patent in suit.

Int. 10. Please look at Complainant's Exhibit Defendants' Machine and state whether it contains, in your opinion, any combination new with the inventor named in the patent in suit, at the record date of his invention, and referred to in the first, second, third, and sixth claims of said patent.

79 (Question objected to on the ground, among other things, that the witness is asked to give an opinion only, as against the sworn statement of the patentee; therefore improper and wholly incompetent.)

Ans. I have examined the machine marked "Complainant's Exhibit Defendants' Infringing Machine," and I find it to contain in combination a mechanism for rendering adhesive a continuous strip of paper; second, a mechanism for feeding the continuous adhesive strip to a pair of clamping dies; third, a mechanism for severing a stay strip from the continuous adhesive strip, and fourth, a pair of clamping dies for pressing the severed stay strip upon the box corner introduced between them; but I find the feeding and cutting mechanism to be new and substantially different from the feeding and cutting mechanism described and shown in the patent in suit, and that the two are differently combined, and that the result produced by these two elements of the combination are new and different from the result produced by the corresponding elements forming a part of the combination described in claims 1, 2 and 3 of the patent in suit. In the machine marked "Defendants' Infringing Machine," the continuous strip of paper is not projected forward as in the feeding mechanism shown in the patent in suit, but is carried forward by a carrying plate, toward the cutting and clamping mechanism. The cutting mechanism described in the patent in suit consists of an independent device actuated by a separate cam, and requiring an adjustment in timing, to correspond with the action of the other parts of the machine. In the defendants' machine the cutting is performed by the action of a stationary lower blade provided with a straight cutting edge, and an upper reciprocating angular or V-shaped blade, by which the opposite edges of the stay strip are simultaneously cut, and the continuous strip severed by the cutting action of the knives from each edge toward the center.

The continuous strip in the defendants' machine is fed to the clamping dies in a line parallel with the line of the apex of the lower die or anvil, so that the method of cutting upon opposite edges of the continuous strip allows the partially severed stay strip to be bent down at its edges and shaped to the box corner before it is entirely severed, thereby removing all possibility of any accidental displacement of the severed strip upon the box corner.

The feeding mechanism shown in the patent in suit consists of a pair of rolls having an intermittent motion by which the continuous stay strip is projected or pushed from the forward side of
80 the rolls toward the clamping dies, and during their period of rest the continuous stay strip is held stationary.

The upper of these feed-rolls acts in connection with the lower feed-roll and an elastic bed consisting of a series of parallel wires, to move the stay strip forward. This forward movement of the stay strip is accomplished with the adhesive side next the elastic bed, producing a scraping action between the adhesive side of the stay strip and the wires forming the elastic bed.

Any resistance to the forward movement of the continuous strip between these feed-rolls and the cutting mechanism and clamping dies, such as would be produced by the clogging of the gum, or by other causes, has to be overcome by the stiffness and inflexibility of the stay strip itself.

There is no co-operation between the feed-rolls and the cutting mechanism, except that they are made to act at the proper period of time relatively to each other. The stay strip is fed from the side of the clamping dies and in a line at right angles with the line of the apex of the lower die or anvil, so that the cutting must be effected before one of the advancing lower corners of the upper die arrives in the horizontal plane occupied by the top of the box corner, or, requiring the complete separation of the stay strip before the separated strip is shaped to conform to the box corner. The cutting action of the mechanism shown in the patent in suit takes place upon one side of the continuous strip only, and causing any undue strain in cutting to cause the displacement or lateral movement of the continuous strip.

In the defendants' machine the feeding motion consists of a carrying plate having a reciprocating motion and provided with a hinged pawl, with its point engaging the continuous strip. This carrying plate is placed beneath the strip and the hinge pawl above standing at an inclination to the line of motion of the carrying plate, and the pawl is provided with a spring which presses the free end or tip of the pawl upon the upper surface of the continuous stay strip; so that, as the carrying plate moves forward toward the cutting and clamping mechanism, the spring-actuated pawl will engage the upper surface of the continuous strip and press against the carrying plate, causing the continuous strip to be moved forward with the forward movement of the carrying plate.

Upon the reverse movement of the carrying plate, the point of the spring-actuated pawl becomes disengaged from the continuous strip, allowing the carrying plate to move back without
81 reversing the motion of the continuous strip. A parallel wire is arranged over the continuous strip and in the path of the pawl, at its extreme rearward motion. This wire is so arranged as to lift the pawl, entirely free from the stay strip at the rear part of its reverse motion, and the carrying plate is placed sufficiently below the under surface of the stay strip as to be free from contact with it when the spring-actuated pawl is raised off from the stay strip.

The cutting action of the blades begins at the beginning of the period of "dwell," of the carrying plate at its forward movement, so that an incision will be made in the opposite edges of the stay strip before the reverse movement of the carrying plate begins,

thereby causing the continuous stay strip to be locked and held during the reverse movement of the carrying plate.

The cutting action of the angular blade and straight blade severs the strip, as I have said, upon opposite sides, allowing the center to remain until the partially severed end is shaped into the form of the box corner.

This peculiarity of the cutting mechanism is new and distinguishes the cutting mechanism of the defendants' machine from the cutting mechanism described by the patent in suit.

I am aware that a feed mechanism different in details of construction, but somewhat similar in its methods of operation to the carrying plate and spring-actuated pawl of the defendants' machine, is found in other mechanisms, such as card-setting machines, wire stitching machines, etc., but the device employed in such machines would not be applicable to the defendants' machine without the co-operation of the cutting dies by which the continuous stay strip is held against the reverse movement.

(Adjourned to 9.30 a. m. Wednesday, Dec. 21.)

Met, pursuant to adjournment, at 9.30 a. m. Dec. 21, same parties present as before.

I have stated that the feeding mechanism known and in use upon card-setting and book-stitching machines, and which are similar to the reciprocating plate and pawl shown in the defendants' machine, could not be used upon a stay strip adapted to be applied to a box corner, for the reason that the similar feeding devices in wire stitching and card-setting machines depend upon the inflexibility or stiffness of the wire fed, which serves to prevent the bending or "buckling" of the wire when resisting a pushing strain.

In the defendants' machine this lack of stiffness or inflexibility of the continuous adhesive strip does not affect the operation
82 of the feeding mechanism, for the reason that the stay strip during the reverse movement of the carrying plate and pawl is locked by the engagement of the cutting knives with the opposite edges of the strip, and the strip is thereby held from being moved back by any accidental friction or engagement of the feeding mechanism with the stay strip during its reverse movement.

If the stay strip were of wire instead of a flexible material, like the gummed and moistened paper, the backward movement of the wire would be resisted by the stiffness of the wire itself, which would hold it from bending or "buckling" between the carrying plate and the paste-roll.

This co-operation of the feeding and cutting mechanism in the defendants' machine, I find to be new and substantially different in its construction, adaptation, and mode of operation, from the feeding and cutting mechanism shown in the patent in suit.

I also find that the combination of the cutting and pressing mechanism is new and substantially different in its construction, adaptation, and mode of operation, from the cutting and pressing mechanism shown and described in the patent in suit.

The cutting mechanism arranged to perform the function performed in the defendants' machine and co-operating with the feeding and pressing mechanism in the defendants' machine, could not be substituted for the cutting mechanism shown and described in the patent in suit and made a part of the combination set forth in either of the claims 1, 2, and 3 of the patent in suit.

There are many minor differences of construction between defendants' machine and that shown and described in the patent in suit, such as the introduction of a serrated spring blade arranged and adapted to lift the stay strip out of contact with the lower cutting blade; a latching mechanism by which the rotation of the main shaft is set and the upper reciprocating die and cutting blade are locked during their upward movement and held from downward movement and against gravity when their actuating mechanism is detached from the driving power.

These and other points of difference I will not dwell upon, as I do not consider that they relate directly and immediately to or affect the operation of the combination of the pasting, feeding, cutting, and pressing mechanisms.

The cutting mechanism of the defendants' machine is made a part of the pressing mechanism by the attachment of the movable blade directly to the reciprocating upper die, so that it is actuated
83 and moved by the movement of the upper die and its connected actuated mechanism; while in the patent in suit the cutting mechanism forms a separate and independent element controlled by a separate and independent cam requiring a special adjustment in the time and period of its movement, as described and set forth in the patent in suit.

While I find that the defendants' machine embodies the combination of a pasting, feeding, cutting and pressing mechanism adapted to paste, a continuous fastening strip to feed the same to a pair of clamping dies and to sever said continuous strip into stay strips of suitable lengths, and to press the same by the action of a pair of clamping dies upon an interposed box corner, I do not find that the combination of these several elements is the combination described in claims 1, 2 and 3 of the patent in suit, for the reason that the elements of feeding and cutting mechanisms are substantially different from the corresponding elements described in the patent in suit.

In my opinion, the combination of the clamping dies, the feeding mechanism and the pasting mechanism found in the defendants' machine does not contain the invention described in claim 1 of the patent in suit, for the reason that the feeding mechanism is substantially different from the feeding mechanism described in said claim 1 and shown and described in the patent in suit, and that the feeding mechanism and clamping dies of the defendants' machine have a joint and co-operative action which is not found in the combination described in claim 1 of the patent in suit.

I do not find the invention described in claim 2 of the patent in *in* suit present in the defendants' machine, for the reason already given with reference to claim 1, and also for the additional reason

that the cutting mechanism of the defendants' machine is substantially different from the cutting mechanism described in said claim 2 and in the patent in suit, and the cutting and pressing mechanism in the defendants' machine have a joint and co-operative action which is not found between the cutting and pressing mechanism set forth in said claim 2 and in the patent in suit.

I do not find the invention described in claim 3 of the patent in suit to be present in the defendants' machine, for the reasons I have already given with reference to claims 1 and 2.

I find that the upper die in the defendants' machine is capable of a slight yielding movement under pressure, and I find that this result is secured by introducing a spring between the
84 die proper and a reciprocating carrying block or frame, and making the die proper capable of a slight sliding movement relatively to the carrying block and against the tension of the spring, and this construction I consider substantially similar to that shown in the patent in suit and referred to in claim 6 of said patent; but this construction was a well-known and commonly practiced expedient to secure an elastic or yielding pressure between an opposing pair of clamping dies long before the record date of invention of the patent in suit.

By the term "defendants' machine" in the preceding answer, I have referred to the machine shown by Complainant's Exhibit Defendants' Infringing Machine.

Int. 11. Examine Complainant's Exhibit Defendants' Infringing Machine, with reference to the combination therein shown, of pasting, feeding, cutting and pressing mechanisms adapted to paste, feed, cut and press a stay strip upon a box corner, and compare the same with the state of the art prior to the record date of the patent in suit, and state what similarities or differences, if any, you find.

(Question objected to by plaintiff's counsel on the ground, among other things, that the question has been already fully answered in detail, and therefore a needless repetition, consequently a needless waste of time.)

Ans. I have examined Complainant's Exhibit Defendants' Infringing Machine, with reference to the combination therein shown, and referred to in the question asked me, and I find that the broad combination of pasting, feeding, cutting and pressing mechanisms shown in the defendants' machine is substantially the same as the combination of pasting, feeding, cutting and pressing shown in the patents to Beecher & Elliott, to Gates, and to Sawyer, to which I have already referred. The several elements are arranged in the same relative position to each other, and the functions performed by each are the same in kind, and the result of the combination of the several elements is the same in kind. The continuous strip of paper in the defendants' machine is drawn from a continuous roll, as in the Gates patent. It is drawn across and in contact with a paste-roller by which the strip is rendered adhesive; it is fed forward with an intermittent motion by a feeding mechanism, as in the Gates and Sawyer patents; the continuous strip so fed is severed

into separate pieces or strips, as in the Gates patent and in the Sawyer patent, and the severed piece or strip is delivered by the feeding mechanism between a pair of opposing clamping dies. The
85 opposing clamping dies instead of having plain faces, as in the Sawyer patent, and in the Gates patent, and in the patent to Beecher & Elliott, are provided with the angular faces corresponding to the angular shape of the box corner similar to the clamping dies shown in the patent to Waters and in the patent to Cohn, to which I have already referred; or in other words, the clamping dies of the defendants' machine are changed from the shape shown in the Beecher & Elliott, Gates, and Sawyer patents, to the shape suggested and required by the peculiar shape of the work to be performed by them.

I find that the defendants' machine differs radically in its combination of pasting, feeding, cutting and pressing mechanisms, from the corresponding combination as exhibited by the patents to Beecher & Elliott, to Gates, and to Sawyer, only in the details of construction and method of operation of the individual elements forming the combination.

Int. 12. Examine the machine now shown you, with reference to the combination therein shown, of pasting, feeding, cutting and pressing mechanisms adapted to paste, feed, cut and press a stay strip upon a box corner, and compare the same with the state of the art prior to the record date of the patent in suit, and state what similarities or differences, if any, you find.

(Counsel for defendants offers in evidence the machine referred to in the question, and the same is marked "Hobbs' No. 2, W. K. B. Jr., sp'c'l ex'r.")

(Plaintiff's counsel objects to the question, as well as such answer as may be given thereto, on the ground, among other things, that such are wholly immaterial, irrelevant and incompetent. The admission of the machine referred to as an exhibit is also objected to as wholly immaterial and irrelevant, as well as any allusion thereto by way of comparison.)

Ans. I answer, I have examined the machine referred to in the preceding question, and find the same general combination of pasting, feeding, cutting and pressing mechanisms exhibited in the patents to Beecher & Elliott, to Gates, and to Sawyer. The machine is provided with a reel support for holding a continuous roll of paper, substantially as shown in the patent to Gates, referred to it contains a paste-roll, across and in contact with which the continuous strip of paper as drawn by the action of a feeding mechanism, substantially like the mechanism shown in the patent to Gates
it is provided with a tank or receptacle to hold the adhesive
86 material in contact with the paste-roll, as in said patent to Gates; it is provided with a feeding mechanism adapted to feed the continuous strip, and deliver the same between a pair of opposing clamping dies, and performing in this respect, the function performed by the feeding mechanism in the patents to Beecher & Elliott, to Gates, and to Sawyer. It is provided with a cutting

mechanism by which the continuous strip is severed into separate pieces whose length is determined by the intermittent action of the feeding mechanism, and this cutting mechanism in this respect performs the same function as an element in the combination, as the cutting mechanism shown in the patent to Sawyer, and in the patent to Gates, performs in the combination therein shown. I find the machine to be provided with a pair of opposing clamping dies which are adapted to press a piece of work interposed between them, and to attach the adhesive and severed piece upon such work, in substantially the same manner as the clamping dies shown in the patent to Sawyer. The only change in said clamping dies, so far as it relates to the function performed by them, consisting in the change or modification of the shape of their working faces, as would naturally be suggested by the shape of the work upon which they are designed to operate.

I have so far spoken only of the combination of the several elements referred to in the question, and I find the combination to be substantially the combination exhibited by the patent to Sawyer and to Gates and to Beecher & Elliott.

I find, however, differences in the construction and operation of the feeding mechanism by which the paper is fed to the clamping dies in a new and different manner from that shown in the prior patents I have referred to; and I also find certain differences in the cutting mechanism, by which a new and different result is secured, from the cutting mechanism shown in the prior patents referred to; for example, I find the feeding mechanism to be a "carrying mechanism," by which the continuous stay strip is seized and carried forward, instead of being projected or pushed forward, as in the feeding mechanism shown in the patent to Gates, and to Sawyer; the feeding mechanism consisting of a carrying plate and an engaging pawl which moves forward simultaneously with the strip, in the place of a pair of feed-rolls journalled in fixed bearings, and which move the continuous strip by a rolling contact. And I further find that this peculiar feed mechanism is rendered effective by the co-operate action of the cutting mechanism which engages
87 and locks the continuous strip from movement during the reverse motion of the carrying plate.

The cutting mechanism, while it differs from the cutting mechanism shown in the patent to Gates, is substantially the same in its method of operation as the cutting mechanism shown in the patent to Sawyer, and like the Sawyer cutting mechanism, it consists of a lower or stationary cutting plate or blade over which the continuous strip passes, and reciprocating plunger provided with a cutting edge acting in conjunction with said stationary cutter, to sever the continuous strip.

I find, however, that the cutting mechanism of the machine in question differs from the cutting mechanisms shown by the prior state of the art, in that the lower cutter consists of a straight cutting edge or blade, and the upper cutter consists of a V-shaped blade engaging the opposite edges of the strip, and cutting from each edge

toward the center at the same time the opposite edges of the strip are being pressed down by the action of the reciprocating die.

These features of difference distinguish the machine in question from the prior structures to which I have referred, but the combination of the different elements, broadly considered, is the same as the similar combination shown in the patents referred to; and I may here say, that in its main and essential features, the combination of the pasting, feeding, cutting and pressing mechanisms, and the construction and operation of the several elements forming said combination in the machine referred to in the question, are substantially the same in the machine in question as in the machine marked Complainant's Exhibit Defendants' Infringing Machine. And, therefore, what I have just said with reference to the machine referred to in the question, equally applies to the machine in said complainant's exhibit.

Cross-examination by Mr. DANE:

Cross-int. 13. Please tell the court which one of the several exhibits and patented inventions, to which your attention has been called and about which you have testified, most nearly approximates the invention described and covered by the first claim of complainant's patent.

Ans. Possibly the Sawyer 1875 patent, or the Sawyer 1875 model.

Cross-int. 14. Well, which one of the referred to in your last answer?

88 Ans. I mentioned the two, as I consider them substantially the same, and I will testify, the Sawyer 1875 patent although I think there is no substantial difference between the machine shown and described in said patent and the Sawyer 1875 model.

Cross-int. 15. Well, which of the several exhibits and patented inventions about which you have testified most nearly approximates the inventions described or embraced in the second claim of complainant's patent?

Ans. I think there is but little difference between the combination as exhibited in the Sawyer patent and in the Gates patent, when considered as anticipating the invention set forth in claim 2 of the patent in suit; but as I am asked to name but one, I will mention the Sawyer patent, although it must be understood that the invention set forth in both claims, 1 and 2 of the patent in suit, are for a combination of different elements, and while the machine described in one prior patent might approximate more nearly with respect to other elements, so that the selection of any one machine showing closest approximation to a given combination of several elements may be misleading and not strictly accurate without modification.

Cross-int. 16. Then, if I understand you correctly, the Sawyer patented contrivance as set forth in his specification, is the one, out of all the several exhibits about which you have testified, which is most nearly like the invention embraced in the second claim of complainant's patent? Am I correct in my inference?

Ans. What I mean to say is, that the Sawyer 1875 patent shows

and describes the several elements mentioned in claim 1 and in the same combination in which they are therein placed, and it also shows and describes the several elements mentioned in claim 2, and in the same combination as therein described.

Cross-int. 17. Then, as a matter of fact, you say that the Sawyer patent of 1875 is the nearest approximation to the combination embraced by the second claim of complainant's patent, of all?

Ans. I will not say the nearest, but I consider it substantially as near, so far as the combination of the different elements mentioned in said claim is concerned, from the fact that it embodies in substantially the same combination, the dies, the feed, and the cutting mechanism; although with respect to the construction and function of the elements individually considered, other prior structures——

89 (Plaintiff's counsel interposes at this point an objection to the method adopted by the witness, to avoid answering the question responsively, and therefore requests that he answer directly, rather than irresponsively; and for brevity, asks the examiner to again repeat cross-interrogatory 15, with the request that the witness give a direct answer to the question as propounded.)

(Counsel for defendants requests the witness to finish the sentence that he was dictating when interrupted.)

(Notwithstanding the request of defendants' counsel, Mr. Dane still insists that his objection is not only timely, but proper, and therefore insists upon the repetition of cross-interrogatory 15, in order that no more time may be needlessly wasted.)

(Witness continues:) May show points of closer similarity.

Ans. 2. As I have previously replied, there can be no "nearest" approximation between two prior structures equally near in their points of similarity and resemblance, although one may approach the invention set forth in claim 2 of the patent in suit, upon one side, and the other upon an opposite side. I will, however, as I have before done, mention the Sawyer patent, but I must insist that any method of comparison between structures, taken as a whole, but having dissimilar elements, may be misleading without the explanation I have already made.

Cross-int. 18. Then, if I understood you, you seem to be at a loss to determine whether it is the Sawyer patent of '75, or some other patent, about which you have testified, which is the nearest approximation to the second claim of the plaintiff's patent—am I correct?

Ans. I think the question suggests the inherent difficulties in making degrees of comparison, rather than comparisons themselves, between mechanical structures which possess points of similarity and dissimilarity.

Cross-int. 19. I will now ask you to state whether the Sawyer patented contrivance of '75, or some other anticipating device about which you have been testifying, is the nearest in degree to the invention described in the second claim of plaintiff's patent?

Ans. There can be no "nearest" between patented structures equally near.

Cross-int. 20. Do you mean to tell the court that all of the several alleged anticipating contrivances about which you have been testifying, put in evidence by and on the part of the respondent, are each and all on the same plane, each embodying the same
90 factors, and in the same combination, as appears in the Sawyer patent of '75?

Ans. I have not so stated.

Cross-int. 21. What others of the several exhibits, other than the Sawyer patent of '75, embrace the same factors and in the same combinations as the factors and combinations in the patent referred to?

Ans. The patent granted to Beecher & Elliott and the patent granted to Gates, to which I have referred.

Cross-int. 22. I infer, by your last answer, that you wish the court to understand that the patented contrivance of Beecher & Elliott, and that to Gates, each, embrace the same factors and in the same combination appearing in the Sawyer patent of '75; is that so?

Ans. They embrace substantially the same factors and in substantially the same combinations.

Cross-int. 23. I infer from your last answer, that you concede a variation, from the fact that you use the word "substantially" rather than to say, they are precisely the same; am I mistaken in my inference?

Ans. I used the word "substantially" for the reason that I recognize certain differences in the construction and operation of individual elements in the different combinations shown by the several patents referred to.

Cross-int. 24. I now ask you to specify which one of the several supposed anticipating devices about which you have been testifying, whether it be patent or machine exhibit, that most closely approximates to the third claim of plaintiff's patent?

Ans. I make the same reply as I have already made to similar questions referring to claims 1 and 2, and refer to the same patents to which I have already referred, viz., the Sawyer 1875 patent, the Sawyer 1875 model, the patent to Beecher & Elliott, and the patent to Gates.

Cross-int. 25. Then you consider the several patented contrivances and the model referred to in your last answer, to be substantially one and the same, as to factors, the manner in which they are combined, and operate. Is that so?

Ans. Substantially the same, when considered with reference to and in comparison with the factors and the combination of factors set forth in claim 3 of the patent in suit.

Cross-int. 26. Do you wish the court to understand that in
91 your best judgment, the Gates patented contrivance shows the same factors in the same combination, and operating the same, as the several factors and the combination and mode of operation, of the Sawyer patent of '75?

Ans. I have not so stated; what I mean is this: That the Sawyer patent and the Gates patent both show, and they are alike in this respect, a series of factors each performing the same function in

l, and the several factors are combined in both machines in sub-
tially the same way.
ross-int. 27. Then, if I understand your last answer, I was in-
rect in my inference contained in cross-interrogatory 26—am I
t?
ns. I mean that the combination of a pressing mechanism, a
ing mechanism, a pasting mechanism and a cutting mechan-
are present in the machines shown in the Sawyer patent and in
Gates patent, and that the combination of these mechanisms is
stantially the same in both these patents.
The statement is objected to as irresponsive, and the question 27
eated.)
ns. Upon considering cross-interrogatory 26, to which the last
questions refer, I will say that your inference was correct, ex-
t with reference to the expression "operating the same" used in
ss-interrogatory 26, interpreting that phrase to mean the general
ction of the factors in the combination and not specific methods
peration peculiar to each; the Gates patent and the Sawyer
nt of 1875 show substantially the same structures, in my opin-
so far as I have used them in comparison with the invention
forth in the claims of the patent in suit.
ross-int. 28. I ask you to consider them without reference to
intiff's claims, and ask you to state whether you find the princi-
factors in the same combination and operating the same in both
es and Sawyer patents?
ns. I do; substantially the same.
ross-int. 29. Substantially, but not exactly the same?
ns. I mean by "substantially" that the operation and function
ach of the factors is the same in kind in both structures referred
although there may be minor differences of operation in each of
factors individually considered.
Adjourned to 2.30 p. m.)

(Cross-examination continued at 2.30 p. m.:)

Cross-int. 30. Please tell the court what one of the several exhibits to which your attention has been called and about which you have testified, contains the nearest approximation way of factors in the same combination, as the factors and combinations embraced in the sixth claim of plaintiff's patent?
Ans. I will refer to the patent to Smith, 206,145, as perhaps com-
as near as any.
Cross-int. 31. Do you think that the Smith patented contrivance bodies the factors and in the same combination as the factors combination embraced in the said sixth claim of complainant's ent?
Ans. Substantially the same.
Cross-int. 32. And that the combination referred to as contained the Smith patent operates the same as does the factors and com-

bination of the invention specified in the sixth claim of plaintiff's patent?

Ans. I am of the opinion that it does.

Cross-int. 33. What do you understand to be the meaning of the words "substantially as described," which form the closing portion of each of the claims in controversy in reissued patent of complainant, No. 11677?

Ans. I understand the term "substantially as described" at the close of each of the claims 1, 2, 3 and 6, to mean, that each of the separate elements mentioned in said claims as forming the combination described in said claim, is to be considered in its construction and operation, to be the construction and operation which is shown in the drawings, and described in the descriptive part of the specification.

Cross-int. 34. With the definition which you have given in your last answer in mind, would you consider the Dennison machine or the patented contrivance set forth in Exhibit Sawyer Model embraced within the terms of either the first, second, third or sixth claim of complainant's patent?

Ans. I should not.

Cross-int. 35. And also in light of the same definition, it is your opinion that the machine marked "Complainant's Exhibit Defendants' Infringing Machine," is not embraced within the first, second, third and sixth claims of complainant's patent, without reference to other exhibits, whether it be machines, or mechanism described in any of the several patents which have been put in evidence in this case on the part of the defendants?

Ans. I think the machine marked "Complainant's Ex-
93 hibit Defendants' Infringing Machine," is not embraced in claims 1, 2 and 3 of the patent in suit, but that it is embraced by claim 6.

Redirect examination by Mr. BEACH:

Redirect Int. 36. Please explain a little more fully what you mean by your last answer.

Ans. I mean, that the combination of the clamping dies and the feeding mechanism and the pasting mechanism in the Complainants' Exhibit Defendants' Infringing Machine differs substantially from the combination set forth in claim 1 of the patent in suit, when said combination is interpreted by making the term "substantially as described" apply specifically to each of the separate elements; also that the combination of the clamping dies, the feeding mechanism and the cutting mechanism in defendants' machine is substantially different from the combination of the same elements contained in claim 2 of the patent in suit, when similarly interpreted; also that the combination of the dies, the feeding mechanism, the pasting mechanism and the cutting mechanism of defendants' machine, is substantially different from the combination contained in claim 3 of the patent in suit, when similarly interpreted, as I have stated with reference to claim 1, and that, therefore, said defendants' ma-

ine, in my opinion, is not embraced by said claims 1, 2 and 3; t I do find, when considered without reference to any patents, achines or exhibits prior to the record date of invention of patent suit, that the defendants' machine embraces opposing clamping es constructed as described in claim 6, so as to act with an elastic yielding pressure, and that, therefore, the description of the com-nation contained in claim 6, would be substantially an accurate scription of the similar combination contained in the defendants' achine, but I do not admit that the combination and description the invention described in said sixth claim is not fully and com-etely anticipated by the exhibits in this case, disclosing the prior ate of the art.

RUFUS B. FOWLER.

Attest: WARREN K. BLODGETT, Jr.,
Special Examiner.

Counsel for defendant offers in evidence a copy of British letters tent, No. 16137, dated December 8, 1884, and the same is marked Defendants' Exhibit Haddan Patent, W. K. B., Jr., sp'c'l ex'r."

It is agreed by and between counsel for the respective parties that Rufus B. Fowler, who has previously testified in is suit, would, if recalled, testify as follows:

I have examined the Haddan patent, No. 16137, of 1884, very refully, and find that it shows and describes a machine for apply-g a corner stay to a pasteboard box. It is true that the corner ay consists of a wire staple instead of a pasted strip of paper or oth, and therefore a pasting mechanism is not needed and is not esent in the Haddan patent; with this exception, the specific ele-ents, as enumerated in the first three claims of the Beach patent suit, and the combinations of the same, as described in said Beach tent, are present in the Haddan machine. The Haddan patent scloses a machine containing a feeding mechanism by which the re is fed from a continuous roll by means of feeding rollers rotated termittently; second, a continuous strip of wire is cut off into itable lengths to form the staple or stay strip; third the stay strip delivered by the intermittent machine feeding mechanism be-ween a pair of opposing clamping dies, having diverging faces so ranged as to co-operate in pressing the staple or stay strip upon interposed box corner.

The Haddan machine shows precisely the same combination in rms that is described in claim 2 of the Beach reissued patent, viz: Opposing clamping dies having diverging working faces," " and eding mechanism constructed to feed forward a continuous fasten-g strip," "and a cutter for severing the said continuous strip into fety strips of suitable lengths;" and it can, more-ver, be accurately id that the clamping dies of the Haddan machine are "arranged co-operate in pressing adhesive fastening strips upon interposed x corners," so that the description of the Beach invention in claim of the Beach reissued patent would amply describe the combina-on present in the Haddan machine.

I am not unmindful of the fact that the connected, actuating mechanism by which the feeding, cutting and pressing devices are operated, differs in some respects from the corresponding mechanism of the Beach patent; but that does not alter or change my conclusion that the combination of devices in the Haddan machine is not only a combination for an analogous purpose, but is substantially the same combination that is described in claim 2 of the Beach reissued patent.

I do not think, in view of the prior state of the art with reference to box covering machines, that it would require any inven-
95 tion to add a paste-box and paste-roll to the combination of pressing, cutting and feeding mechanisms shown in the Haddan machine. The Haddan patent shows that prior to Beach a machine was known embodying a combination of the several mechanisms mentioned in claim 2 of Beach's reissued patent and which was adapted to fit, cut, and press an adhesive stay strip on the corner of a box, and which could be used without any substantial change, in connection with the well-known mechanism for pasting a continuous strip of paper or cloth, and I see no reason why a box manufacturer could not take the Haddan machine and the pasting mechanism of Gordon Munro and do everything that the Beach machine does, everything that Beach claims in his patent, without making any changes or alterations which would require invention or anything more than the skill and good judgment of an ordinary mechanic conversant with the construction and operation of box-making machinery, would dictate.

It is further agreed that the foregoing may be used with the same force and effect as if testified to by Mr. Fowler when upon the witness stand. The right to cross-examine reserved.

Boston, Mass., May 10, 1893.

JOHN DANE, Jr.,
Counsel for Complainant.
EDWARD S. BEACH,
Counsel for Defendant.

Circuit Court of the United States for the District of Massachusetts.
In Equity.

FRED H. BEACH, Complainant,
v.
THE HOBBS MANUFACTURING COMPANY ET AL., Defendants.

Notice is hereby given, that we shall proceed to take proofs for final hearing on the part of the complainant, under the 67th rule of the Supreme Court for courts in equity, as amended, or in accordance with the statutes in such case made and provided, and in pursuance of the rules and practice of this court, before an examiner of this court, or other proper officer, under said statutes and
96 rules, at the office of John Dane, Jr., No. 261 Broadway, N. Y., on the twenty-third (23d) day of June, 1893, at eleven o'clock in the forenoon.

The names and residences of the witnesses who live at a greater distance from the place of trial than one hundred miles, whom it is intended to examine, are stated below.

You are invited to attend and cross-examine any witnesses produced. The examination will be adjourned from day to day, and to such time and place as may be required, without further notice.

Dated New York city, June 19th, 1893.

JOHN DANE, JR.,
Solicitor, 261 Broadway, New York.

To Edward S. Beach, Esq., defendants' solicitor.

Names of witnesses.	Residences.
Fred H. Beach	Rochester, N. Y.
Henry L. Breevort	Brooklyn, N. Y.

Complainant's Evidence in Reply.

NEW YORK, *June 23d*, 1893—11 o'clock a. m.

Met pursuant to notice.

Present: John Dane, Jr., Esq., counsel for complainant.

Mr. Edward S. Beach has signified by letter that he would not be present this morning, but that we might proceed with the examination of witnesses, reserving to him the right to make such objections as he might make if present, and to cross-examine, if he should desire.

FRED H. BEACH, being called to testify in his own behalf, being first duly cautioned and sworn, and examined by Mr. Dane, testifies as follows:

Int. 1. What is your name, age, residence and occupation?

Ans. Fred H. Beach; age, 47 years; residence, Rochester, N. Y.; occupation, manufacturer of paper-box machinery.

Int. 2. Are you the same Fred H. Beach, the complainant in this case, and patentee of letters patent No. 447,225, dated February 24th, 1891, reissued May 26th, 1891, No. 11167?

Ans. I am.

97 Int. 3. When first did you construct and put into practical operation a machine for staying the corners of boxes of the kind and character described and shown in the said original and reissued letters patent, referred to in my last previous question?

Ans. I first constructed the machine of this description in the fall of 1885, and put the machine into practical use in the spring of 1886.

Int. 4. Where were you living at the time you made the first practical operating machine, and where and by whom was it first used?

Ans. At Rochester, N. Y., and the first machine was used under my direction at the seed warehouse of James Vick, Rochester, N. Y.

Int. 5. State whether or not the said machine operated successfully at the seed warehouse referred to?

Ans. It operated successfully, and was used to stay up a great many boxes, at least more than 30,000.

Int. 6. What, if any, difficulty did you have in procuring your patent for the invention referred to?

Ans. Soon after my application was made, it was put into interference with an application of James C. Marshall, of Boston, which interference was decided in my favor. The application was then put into interference with Gustave L. Jaeger, of New York, and a large amount of testimony taken; this case was also decided in my favor. Thereafter my application was again put into interference with the application of one Horace Inman, of Amsterdam, N. Y., and also with the application of David Rice, of Boston, Mass., also with that of Mark D. Knowlton, then of Chicago, Ill., in which a large amount of evidence was taken at a great cost and expense, resulting in the rendering of decisions in each of the cases in my favor. In the case of Inman against Beach, appeals were made by said Inman from each tribunal until it could be carried no farther, and in each instance they were decided in my favor; thereupon my patent was granted and issued February 24th, 1891. After the final decisions rendered in the several interferences in the Patent Office, Horace Inman and Gustave L. Jaeger instituted proceedings in the United States circuit court in and for the northern district of New York, about the 2nd day of October, 1890; for the purpose of having the court declare the invention in question in favor of said Inman and against myself, thereby attempting to secure through the aid of the court, that which had already been repeatedly
98 decided in my favor in the United States Patent Office. These proceedings, after the taking of a vast amount of evidence, resulted in a disposition of the case by his honor Justice Wallace, during last November term of court, held at Syracuse, N. Y.

Int. 7. What value or advantage had the machine invented and patented by you, over old methods then in use, or that were used prior to your invention in question?

Ans. Previous to my invention boxes were stayed up, or in other words, reinforcing pieces were put upon the corners by hand, which was a slow and tedious operation, and required considerable skill to produce good and evenly stayed work. With the machine in question the manufacturer is able not only to save upwardly of 75 per cent. in the cost of "staying," but the work is done in a much stronger and neater manner. The corners of boxes or lids are by the machine brought closely together, and a perfectly square corner is insured, and the "stay" is more firmly secured, thus simplifying and cheapening the operation of covering the box. There are also other advantages derived by my machine over the prior art—for instance, the machine places the strip over and upon the corners, and presses the same into position in manner better, more uniform, more firm, and more securely than is possible by any other means known in the art at a time prior to my invention. The stay strips can be cut narrower when applied by my machine than when to be applied by hand, thus a saving of material is insured; furthermore, by the use of my machine a perfectly finished box corner is insured,

and such as to require no further finish or covering, in many cases where it would be impossible to accomplish the same results by hand.

The automatic adjusted pressure exerted by impinging upon the inner and outer corners during the application and securing of the strips is such as to make it unnecessary to pile the boxes for drying after such "staying," as was required before my invention, as the moisture is largely expunged while the engaging parts or fibres of the parts are being intersected firmly together and left nearly dry at the disengagement or pressure; this renders it possible for the producer to immediately pack and deliver boxes; whereas, formerly, much time was lost in waiting for the drying, and much space consumed that was desirable to avoid, and the saving enables the producer to at once move his boxes and continue with others.

(1.30 p. m. Adjourned for recess to 2.30 p. m.)

Met pursuant to adjournment.

99 Int. 8. State whether or not you have made machines in accordance with your patent, and if yea, to what extent and with what satisfaction have they been received, if you know?

Ans. I have continuously manufactured staying machines made in accordance with my patent beginning 1886, and have sold several hundred of them to paper-box makers in all parts of the United States, and have many testimonials as to their advantage, value and excellence in the box shop, and for a greater part of the time since the granting and issuance of my patent we have been pressed with orders to an extent that made it necessary for us to operate our manufactory more or less overtime.

(Adjourned to Saturday, June 24th, 1893, at 11 o'clock a. m.)

JUNE 24TH, 1893—11 o'clock a. m.

Met pursuant to adjournment.

Present: John Dane, Jr., Esq., counsel for complainant, and Edward S. Beach, Esq., counsel for defendants.

(Whereupon the case is further adjourned to Monday, June 26th, 1893, at 9.30 a. m.)

JUNE 26TH, 1893—9.30 o'clock a. m.

Met pursuant to adjournment.

Present: Counsel as before.

Cross-examination of Mr. FRED H. BEACH by EDWARD S. BEACH, Esq., counsel for defendants:

Cross-int. 9. Was the machine which you first constructed in the fall of 1885 a full-sized operative machine?

Ans. It was.

Cross-int. 10. And it was used publicly in the fall of 1885?

Ans. It was used publicly in the spring of 1886.

Cross int. 11. Was it used in the fall of 1885?

Ans. Only in an experimental way.

Cross-int. 12. In whose presence?

Ans. In the presence of my son, and a machinist by the name of Wilsie, and other men in the machine shop.

Cross-int. 13. In what month in the fall of 1885 was this machine first used?

Ans. I think it was used in the month of September.

Cross-int. 14. And a good many box corners were stayed on it, I suppose?

Ans. Yes, quite a number.

100 Cross-int. 15. Was this machine not used quite frequently, between September, 1885, and the spring of 1886?

Ans. Yes, it was frequently in an experimental way.

Cross-int. 16. And this machine when first constructed and used in the fall of 1885, contained, I suppose the mechanism enumerated in claims 1, 2, 3 and 6, of the reissued letters patent in suit?

Ans. It did.

Cross-int. 17. Did the machine when it was put into what you call public use in the spring of 1886 differ in any material or substantial respect, so far as regards the subject-matter of claims 1, 2, 3 and 6, of the reissue of letters patent, from its condition in the fall of 1885?

Ans. It did not.

Cross-int. 18. When you made this machine your plan was, was it not, to have the stay strip cover the outer surface of the box corner, and then pass over its edge, and down into the box so as to stay the corner both outside and inside?

Ans. My intention was to make a machine that would put on a stay in both ways—simply on the outside of the box and also turned into the inside of the box.

Cross-int. 19. Your original application was filed June 10th, 1885; when you went into the Patent Office with this original application, you stated, as appears from Defendants' Exhibit File-wrapper and Contents of your original patent No. 447,225: "It is customary in making paper boxes to apply a strip over the corners which is pasted down on each side, and the overlapped end is turned under the under side." Such work so far as I am aware has heretofore been done by hand. My improvement consists of a machine to do the work, constructed, arranged and operated as hereinafter described. In such a machine, a down-turner or strip-bender and the horizontally reciprocating plunger or in-turner, are essential elements, are they not?

Ans. I think they are.

Cross-int. 20. And the defendants' machine does not contain, does it, either of these elements?

Ans. I think it does not.

Cross-int. 21. And it is true, is it not, that before you made either of claims 1, 2 and 3 of the reissued letters patent in suit, a machine containing the elements thereof and constructed and used by you had been in public use and on sale more than two years?

101 Ans. I don't understand that it is.

Cross-int. 23. You did not make either of the claims 1, 2

and 3 now appearing in the reissue in suit until the 7th of November, 1890, did you? I am not unaware of the claim filed in an amendment dated March 5th, 1887; but it appears from the file-wrapper and contents that on November 7th, 1890, you cancelled all the drawings theretofore furnished, and substituted three new sheets of drawings, filed with said amendment, and then also cancelled the entire specification and claims and substituted an entirely new specification for what had been cancelled. It does not appear from the file-wrapper that you signed the substitute specification, and it does not appear that any signature thereto was attested by two witnesses, and it does not appear that the substitute specification was accompanied by any oath of invention. It does appear from said exhibit that claim I then filed was made broader in terms "to cover that class of staying machines (some of which have been recently patented) in which previously cut stay strips are fed one to the box corner and the adhesive substance applied by the machine." Kindly state now if it is not true that the claims 1, 2 and 3 now in suit were first filed in the Patent Office by you more than two years after your machine had gone into public use.

Ans. I do not understand that they were.

Cross-int. 24. Clamping dies having diverging working faces were old in box-making machines at the time of your invention, were they not?

Ans. Not to my knowledge. I had never seen anything of the kind in a box-making machine.

Cross-int. 26. But you know it to be a fact, do you not?

(Question objected to as immaterial.)

Ans. No, I do not.

Cross-int. 27. Well, they were old in the art, as is revealed by prior letters patent, were they not?

(The question is objected to as vague, in that it is not clear as to the "art," whether in box-making or otherwise, therefore misleading.)

Cross-int. 28. Please answer the question with reference to the art of making paper boxes?

Ans. I have never seen anything of the kind used in making paper boxes before my invention.

Cross-int. 29. That isn't the question. Do you not know that in sundry letters patent which have been offered in evidence by the defendant in this suit, which patents relate to the manufacture of paper boxes, and which are prior in date to your invention, clamping dies having diverging working faces are shown and described?

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Ans. I think there is one patent introduced that has something of the kind.

Cross-int. 30. Now let's begin at the back end of your machine. First comes a reel, doesn't there?

Ans. I believe so.

Cross-int. 31. And this reel supports a strip of sheet material?

Ans. It does.

Cross-int. 32. A strip of paper?

Ans. Yes, sir.

Cross-int. 33. The use of a reel carrying a strip of paper was old in box-making machines, was it not, long before your invention?

(Counsel for complainant wishes to have his objection noted to the questions bearing upon the several elements by themselves considered, brought up for consideration under the existing circumstances, for the reason, among other things, that the claims upon which the present suit is based, are for combinations of various elements and factors, which, together with attending parts described in the specifications of the patent, form the invention in question here, therefore, to interrogate the witness as to the existence of factors or features found in other machines in which their parts are not combined to operate as does the several parts and combinations in the patented machine of complainant, is not only improper, incompetent, but wholly immaterial, and that this objection is intended to cover such other and further questions of the same or like character, without special notice or objection being given specifically to such as may follow.)

Ans. I had never seen anything of the kind at that time.

Cross-int. 34. Please assume that clamping dies having diverging working faces, and a cut-off, and a feed, and the paste-roll and a reel, supporting a strip of paper, were each old before the date of your invention and state what new function, if any, is performed by any one of the elements in either of claims 1, 2 and 3 of the reissue in suit.

Ans. Each of those elements perform their part in putting a stay strip onto a paper box, which at that time had never been done to my knowledge, except by hand.

Cross-int. 35. If the stay strip be taken off your machine then the reel and the paste-roll, and the feed, and the cut-off, and the clamping dies are wholly independent one to the other, are they not?

Ans. I should think so.

103 Cross-int. 36. And they are wholly independent one of the other, are they not, when the stay strip is in place?

(The same objection to this line of questions as given to cross-question 33.)

Ans. I don't understand them to be.

Cross-int. 37. Does the cut-off in your machine in anywise affect the action of the clamping dies?

Ans. It does.

Cross-int. 38. How?

Ans. If the strip was not cut off, it would be pulled from the box corner after it was clamped on.

Cross-int. 39. The cut-off might be removed from your machine and the stay strip severed by hand, might it not?

Ans. Yes, but the same combination would exist, whether the cutting-off device was fastened to the machine or held in the hand.

Cross-int. 40. What is that combination that would then exist?

Ans. Why, the hand cut off would simply take the place of the shears attached to the machine.

Cross-int. 41. And the jack-knife or the pair of shears that the person would then use would be an element of the claims in suit?

(The question is objected to as improper, for the claims of the patent in connection with the specifications thereof, are the best evidence as to what constitutes the combinations in controversy.)

(Counsel for defendant denies that there is any combination set forth in either of the claims 1, 2 and 3.)

(Counsel for complainant objects to the inadmissibility of the statement of defendants' counsel, as evidence of any fact, as he is not a witness in this case, neither is he making his statements under oath.)

Ans. Yes, I think there would be the cutting-off device, if a person was able to cut the strips the proper length.

Cross-int. 42. If the cut-off were eliminated from the machine, the dies would operate just the same as if the cut-off were present, would they not?

Ans. No, sir.

Cross-int. 43. Why not?

Ans. Because they would pull the strip off the box corner.

Cross-int. 44. They would press the projecting end of the stay strip down upon the box corner, would they not?

Ans. Not as it should be pressed down.

Cross-int. 45. Still, they would in fact press the projecting end of the stay strip down upon the end of the box corner, would they not?

104 Ans. They would in fact press the projecting end of the stay strip onto the box corner.

Cross-int. 47. If the dies were removed, and all the other elements retained, the cut off, the feed, the paste-roll and the reel, would not each perform the same duty that they would severally perform if the dies were present?

Ans. I presume so.

Cross int. 48. Please explain what, if any, interdependence there is between the elements or factors of claim 1?

Ans. I don't believe that I am lawyer enough to understand your question.

Cross-int. 49. You are familiar with the Sawyer patent, are you and the "Dennison tag machine"?

(Question objected to as immaterial, as they do not contain the combinations of the claims sued upon.)

Ans. I am not.

Cross-int. 50. Haven't you seen the exhibits referred to, the "Sawyer patent" and the "Dennison tag machine"?

(Question objected to as immaterial, for the reason, among other things, that the "Sawyer patent" does not contain the combination of any of the claims upon which the present suit is based.)

Ans. I have seen the exhibits, but could not describe them.

Cross-int. —. Would you say that the reel, paste-roller, and cut-off of your patent, differed in any material respect in the Orr & Wright patent?

(The question is objected to as improper, on the ground, among other things, that the witness has not yet shown that he was qualified to take the different patents and testify properly concerning their similarities and dissimilarities to the inventions set forth in the several claims and specification, upon which this suit is based.)

Ans. I am not familiar enough with the Orr & Wright patent to give an opinion.

Cross-int. 52. I would like to ask you as the inventor named in the patent in suit, if you think it would require the exercise of any invention as distinguished from ordinary mechanical skill, to construct a machine, the essential elements of which would be a paste-roll; a feed to drag a stay strip or the like over the paste-roll and to feed forward the strip to a cut-off; and dies having angular working faces, assuming that it was old in an analogous art, such as the manufacture of paper boxes to stay the corners thereof with strips, by feeding, cutting and clamping between dies having
105 diverging working faces; and assuming also that it was old in box-covering machines to draw a strip of paper over a paste-roll and between the members of a severing mechanism; and assuming also that it was old to draw a stay strip of paper, by feeding mechanism, over a paste-roll or its equivalent, and to protect it between clamping dies having flat working faces?

(Question is objected to, on the ground, among other things, that the witness is asked to assume too many things in the question, not embraced in the claims, and then refer to a patent describing a machine which is not in anywise adapted to do the work of plaintiff's patented machine, for an answer, as to whether it would involve invention, is too remote for consideration by the witness; furthermore, it is wholly incompetent.)

Ans. I think it would.

Cross-int. 58. In what would that invention consist?

(The question is objected to, for it is obvious and certainly would so appear to the court, that a suitable combination of parts operating in a manner to produce the results of the plaintiff's machine are required, which are not found in any of the various exhibits put in evidence on the part and behalf of defendant-.)

Ans. I cannot answer the question further, as I do not consider myself competent to give expert testimony.

Cross-int. 54. Do you think that any person skilled in the art of making paper-box machinery, would have any substantial difficulty in fully understanding the machine set forth in your original patent, No. 447,225, from the drawings and specifications thereof?

Ans. I do not.

Cross-int. 55. The construction and operation of your patented machine and the nature of your invention, and all the features thereof, were set forth in your original patent, No. 447,225, with substantial accuracy were they not?

Ans. I supposed they were.

Cross-int. 56. And you still think so?

Ans. I still think so.

Cross-examination closed.

Redirect examination by Mr. DANE:

Redirect Int. 57. In making answer to cross-interrogatory 19, you are asked among other things—concerning essential elements, in your patented machine, such, for instance, "as a down-turner, or strip-bender and the horizontally reciprocating plunger, or in-turner," and in your answer have stated, that you think "they are essential"—they are essential, I presume, when the machine is
106 intended to fold, bend or turn the strip over the edges at the corner of the box, and within, but are they essential elements when the strip is to be placed upon the outside corner of the box, and not folded over the edge and turned under?

(Interrogatory objected to as being mildly leading.)

Ans. They are not essential when the strip is simply to be placed on the outside of the box.

Redirect Int. 57. What principal defect caused you to reissue the patent upon which this suit is based?

Ans. An error in the drawings.

Redirect Int. 59. Who made the error?

Ans. The draughtsman who inked in the drawings.

Redirect Int. 60. Was it or not an obvious error?

Ans. It was.

Redirect Int. 61. How soon after the error did it come to your attention?

(Question objected to as immaterial. The reissued file-wrapper speaks for itself on all material points, so far as regards the question of diligence.)

Ans. I can't say positively, although it was but a short time.

Redirect Int. 62. How soon after did you take steps to correct the error?

Ans. We took immediate steps to correct the error.

Redirect Int. 63. Had there been in existence at the date when you invented the machine covered by your patent, upon which this suit is based, any device or mechanical apparatus of any sort that was capable of automatically applying and properly securing stay

strips upon the corners of boxes in manner the same or substantially the same as they are applied by your machine?

Ans. Not to my knowledge.

Recross-examination by Mr. BEACH:

Recross-int. 74. There had been in existence prior to your invention, had there not, a device or machine that was capable of automatically applying and properly securing stay pieces of metal upon the corners of boxes?

Ans. Not to my knowledge.

Redirect Int. 65. You know that patents were in existence prior to your invention, which showed such mechanical apparatus, do you not?

Ans. I did not know it at that time.

Recross-int. 66. But it is true, is it not?

Ans. I think it is.

107 Recross-int. 67. And the stay pieces which such box-corner staying machines automatically utilized, were pieces of metal severed from a coil, were they not?

(Question objected to as immaterial.)

Ans. They were.

Recross-int. 68. And the stay pieces which your subsequently invented box-corner staying machine automatically utilize, are pieces of paper severed from a coil, are they not?

Ans. They are usually.

Recross-int. 69. So you are not the first inventor of a box-corner staying machine?

Ans. I am the first inventor of a machine for staying up the corners of boxes with paper or muslin.

Recross-int. 70. But you are not the first inventor of a box-corner staying machine. Please answer the question categorically?

Ans. I am, as the wire machine simply puts a wire stitch through the corner.

Redirect examination by Mr. DANE:

Redirect Int. 71. Do you understand that the machine referred to for attaching the metallic strip by wiring, is in anywise capable of applying the paper stay strips in manner set forth in complainant's patent?

Ans. I do not.

Redirect Int. 72. As you understand it, does the machine for applying the metallic corners in anywise serve to suggest the invention specified in the claims upon which this suit is based?

Ans. It does not, and would not afford any aid to an inventor about to contrive a machine for the purposes for which mine was intended and adapted.

FRED H. BEACH.

Deposition of Henry L. Brevoort.

HENRY L. BREVOORT, recalled on behalf of plaintiff, testifies as follows:

Cross-int. 1. Are you the same Henry L. Breevort that has already been called upon to testify in this case?

Ans. I am.

Cross-int. 2. Since giving your testimony have you read the testimony taken by the defense herein, and especially the testimony of Rufus B. Fowler?

108 Ans. I have read the testimony referred to in the question.

— Int. 3. Have you examined the various exhibits introduced in the deposition of the said Fowler, and do you understand what they are, what they show and describe?

— —.

Cross-int. 4. Please state, in your opinion, any one of the exhibits referred to by Mr. Fowler shows or describes the inventions set forth in the 1st, 2d, 3d and 6th claims of the Beach reissue here in suit, being patent No. 11167, dated May 26th, 1891; and also state in answering the question, whether you agree with Mr. Fowler in the conclusions he has reached, that the inventions specified in the Beach reissue involve nothing but mechanical skill to produce, in view of the state of the art as set forth in his deposition; and in answering this question you may assume that the Beach reissue in suit for the first time shows a machine for attaching stays to the corner of boxes?

Ans. I may say, in beginning the answer, that in my opinion no one of the patents or devices illustrating the state of the art, and which are referred to by Mr. Fowler show the invention of any one of the claims of the Beach reissue in suit; and in my judgment it required more than mechanical skill to produce that which is shown, described and claimed in the Beach patent, even in view of the state of the art. Therefore, I disagree with Mr. Fowler in the conclusions that he has reached.

I will proceed and give my reasons for the statements that I have made. The Beach reissue, as I understand it and as the question states, is the first patent descriptive of a machine for attaching stay strips to the corners of paper boxes. There was nothing in any art as illustrated by patents to suggest to a man such a machine; there was nothing in any art as an earlier reference to indicate that such a machine would be useful if made; and the creation of such a mechanism was entirely a novel creation in a wholly new art. Consequently it cannot be said that anything in any art would lead a man to make such a machine, or would even indicate that such a machine would be a good thing to make, or that such a mechanism could exist and serve a useful purpose.

The position of the Beach reissue, therefore, in the art which it creates is not such a position as a patent would have which recites a mere improvement or modification of some previously existing and well-known form of mechanism, because the Beach mechanism

was not an improvement on anything that had previously existed; nor is it descriptive of a class or kind of mechanism that had
109 ever previously existed in any art. The Beach patent was a pioneer patent, in that it shows and describes a kind of mechanism which never existed until it was set forth for the first time in the Beach patent. No one had ever conceived before Beach of a mechanism for doing this particular work; and, therefore, there was nothing to guide Beach in the making of the machine described in the patent, and there was nothing in any art to indicate to him that such a machine would be of use or of service in the paper-box manufacturing industry.

Mr. Fowler has taken from the art of shoe-making, from the art of brush making and from various arts, such as paper-box making and the like, a very great number of patents, many of which show elements or features which are used in the machine of the Beach patent, but none *or* which show any of the Beach patented combinations, and he says that if any man contemplated the mass of material which he produces in his testimony he could make the Beach machine without invention, because he could have taken from one and from another patent something, and something else from earlier machines, and so could have made up the Beach machine by using the known and older elements that those patents show in combinations different from those claimed and set forth in the Beach patent. I do not know any reason why Mr. Fowler should think that any mechanic could have done this. Mr. Fowler did not do it, and no other mechanic did it until Beach made his invention, and I do not perceive the basis of Mr. Fowler's views that the Beach invention was a clear and obvious thing; in fact, I think the Beach invention was anything but clear and obvious from any older art, for no art shows one single example of a machine adapted to automatically attach stay strips to the corners of boxes. Therefore, how could such art teach anybody how to construct and make such a machine when no one before Beach conceived of such a machine, nor ever conceived that it would be a good thing to make. I do not see that it takes away from, nor belittles the Beach invention in any sense, to say that the various features of the mechanism, when considered by themselves, were old. Beach does not set out to be the inventor of pasting mechanisms, nor dies, nor of springs, nor of such like devices. All of these were admittedly old, well known, and had been used in hundreds of combinations before Beach ever dreamed of his machine, but that does not detract from the fact that for the first time in the Beach reissue we find those old
110 elements combined in a new way, and combined so as to produce an entirely new and different machine from anything that had hitherto existed, a machine capable of performing a new operation in the arts, an operation that had hitherto been invariably performed by hand, and which had never before Beach's time been performed by automatic mechanism.

I do not think that it is necessary to fill up the record with a description of each one of the earlier machines to which Mr. Fowler refers, because to do so would be merely to repeat in my words the

major portion of Mr. Fowler's deposition. But I will, however, refer to the earlier mechanisms without disturbing them, and state my views of their relevancy when compared with the patent of Beach, and the combinations covered thereby. I will take the various earlier patents to which Mr. Fowler refers, and divide them up into patents showing paper-box machinery, patents showing shoe machinery, patent showing sheet-metal machines, patent showing stitching machines for books, and for inserting wire staples in paper boxes. I will put the Sawyer patent in a class by itself, as it does not relate to any one of the four classes above enumerated. By far the greater number of patents referred to by Fowler are in the class of box machinery; I will take up this class first.

The Beecher and Elliott patent of 1883 shows a machine for making a well-known form of match-box, which is a folded paper, or pasteboard box, made by automatic machinery from a gummed strip of paper. It shows feeding devices, dies, mechanism to put glue on the paper and devices for cutting the strip of paper into suitable lengths.

It has no relation whatsoever to the Beach invention, and would not teach any mechanic how to construct the Beach machine. The same thing is true of the Gates patent of 1875, which shows another form of mechanism for accomplishing the same result, and about which nothing more need be said.

The two Inman patents show and describe machines for covering with an ornamental strip, or strips, of paper, the outside of paper boxes. The paper has glue upon it, and the strip, or strips, are folded about the box by the hands of the operator. Of course, these two patents have no bearing on the machine produced by Beach and claimed by him in his patent in suit, and need not be commented upon further.

The two Monroe patents are for the same thing as the In-
111 man patents, the mechanism being different, but the result to be accomplished being the same. The strip, or strips, of paper are laid upon the boxes by hand, the strip, or strips, already having been gummed before their application to the box by hand.

The patent of Waters of 1881, shows dies for bending paper, or pasteboard, into the shape required for a box, and shows so much of the Beach invention as consists of two dies, one a male and the other a female die, having diverging working faces at, or approximately at, right angles one to the other. Such dies were old and well known in other arts, and their existence in no way militates against the validity of the Beach invention; and likewise neither did their existence teach the Beach invention, because the presence of such dies in the art did not teach any one how to make the Beach mechanism, or a mechanism which was equivalent thereto or therefor.

Scarcely any machine that is patented is wholly new in all its features, and in this particular the Beach machine was not entirely new, for the dies used were old; but this, at the same time, does not show that the combinations patented by Beach were old or known, or that they were obvious.

The Kingsbury patent merely relates to a pasting machine, which may be used for automatically pasting or glueing one side of the continuous strips of paper used by box-makers.

Beach does not claim to be the first who ever applied paste to a continuous strip of paper. That was old long before the date of his invention. Therefore the Kingsbury patent does not show, nor even suggest, the combinations patented by Beach.

The same may be said of the Orr & Wright patent, where two strips of paper are used for box-covering purposes, both of which strips have paste applied on one side.

We have now disposed of those references which Mr. Fowler cited, and which relate to the box-making art. I will now take up the Sawyer patent, and in that connection "Defendants' Exhibit Dennison Tag Machine," and "Defendants' Exhibit Sawyer 1875 Model."

Ordinary address tags, as every one is aware, are perforated at one end for the reception of a string. On both sides of the tag, and surrounding the perforation, will be found, in ordinary address tags, a reinforcing circular piece of pasteboard fastened to the tag, the function of which is to keep the string from tearing out of the paper
112 or pasteboard, of which the tag is made. Now, the Sawyer patent describes a machine used, as I understand it, by the Dennison Manufacturing Company, for the purpose of applying these little round patches of paper to the tags, which the Dennison Manufacturing Co. have for many years been making and supplying to the market. The strip from which the patch of paper was punched had upon it some kind of glue, or paste, which was softened by heat, and as the tags passed under the machine, suitable punches punched from two of these strips of reinforcing pasteboard the two little circular patches, and stuck them by heat onto the tag, one on one side, and one or the other. After this was done a hole was punched through the two reinforcing patches, and the tag, thus providing means for attaching the tag to any article to which it is to be fastened. This operation undoubtedly showed that it was not broadly new before the date of the Beach invention to attach one piece of paper to another with a suitable adhesive material, or to punch from a strip a piece of pasteboard or paper, and attach such piece or pieces to another and separate piece of paper.

Mr. Fowler says that any one who had this machine in mind, and who knew of the Waters patent, in which dies having diverging faces as described, could without invention have altered the Dennison tag machine, or the machine of the Sawyer patent, into the machine of the Beach patent. I do not agree with Mr. Fowler in this statement, because the Sawyer patent and the Dennison tag machine are not as they are shown in the patent, or as they exist in the machine, capable of operating upon the corners of boxes; nor is the operation which they perform suggestive in any sense of a machine for automatically attaching stay strips to box corners. They would no more suggest the machine of the Beach patent than would an envelope machine, or any machine in which there was a pasting and cutting operation; and although the similarity may be seen today between the machine of the Sawyer patent and the

Dennison machine, when compared with the Beach mechanism such similarity was not evident or apparent before the Beach mechanism was given to the public. As a matter of fact, the Sawyer patent and the Dennison machine would have been of absolutely no assistance in teaching the mechanic how to construct the Beach machine; nor would they have suggested to a mechanic the combinations which are claimed in the Beach patent; and as a matter of fact, they would not have suggested the doing of anything to the corners of a paper box; and further, as a matter of fact, they are not
113 adapted to operate upon a paper box, nor upon the corner of a paper box, and to make the machine so operate would be to destroy its present condition, and make it over again into some other and different machine. Therefore, I do not think that either Sawyer patent, nor the "Exhibit Dennison Machine," nor the "Exhibit Sawyer 1875 Model," would suggest or teach that which is seen in the Beach reissue.

Turning to the next class of mechanism to which Mr. Fowler refers, and which relates to the stamping of sheet metal, I may say that the Jordan patent, the Wells patent and the Wilson & Miller patent show mechanisms for punching, or bending, sheet metal. When I have said this, I have said about all there is to say. Not one of them shows anything that has the slightest bearing on the Beach invention, nor does one of them show mechanisms or devices which may be used for the purpose of that invention; nor does any one of them show anything, in fact, which would lead a mechanic to the construction of the Beach machine. They do show that springs, dies, punches, etc., were all old; but it is admitted that such mechanisms were old by the Beach reissue itself, in which no such mechanisms by themselves are claimed, but in which, on the contrary, certain particular combinations are claimed, and none of these combinations exists in any one of the patents for operating on sheet metal to which Mr. Fowler has referred.

The next class to which Mr. Fowler refers are the machines for shaping heels and heel-stiffeners. These patents are four in number, to wit: The St. Hilaire patent, the Hatch patent, the Bigelow patent and the Smith patent. They all show dies, punches, etc., for forming and shaping pasteboard, leatherette or the like into stiffeners for shoes. They show various mechanical appliances for this purpose, but none of them shows or describes any mechanism capable of doing the work performed by the Beach machine; nor are they suggestive of that machine or the combinations claimed in the Beach patent. They show that which is admittedly old, to wit: springs, punches, dies, levers, gear-wheels, framing and the like; but the proving of the fact that such devices are old is insufficient to defeat a patent for a particular or specific combination not shown by any one of these shoe machines referred to. Therefore I will pass such references with the statement that none of them shows or contains the Beach invention.

The next and last class of patents to which Mr. Fowler refers is that class which is adapted for sewing or inserting metal
114 supplies, or the like, into the corners of boxes, or into books for the purpose of binding. These patents consist of the

Lieb patent, the Cohn patent and the English patent of Hadden. I suppose that these patents have been introduced in evidence in this case because they show, for example in the Lieb patent, Fig. 2, the right-angled male die, which is one of the things used by Beach; and in the Cohn patent they show a male die having right-angled faces and a die above it, being a female die, having portions of its face at right angles to each other. But these dies as they are shown could not perform the operation which is set forth and described in the Beach patent, for the female dies are arranged so as to be operated in connection with stapling appliances of some kind or another and are not adapted for the performance of the work described in the Beach patent.

The Brewer patent also shows a right-angle male die, but without any co-operating right-angle female die.

The English patent of Haddan has a right-angle male and female die, but the operation of the device relates entirely to wire stitching, and is not addressed to the box art, nor to the feeding of a gummed strip, nor to the attaching by glue of a gummed strip on a box or box cover.

The mere existence of dies in the earlier mechanisms in no way shows or describes the invention of the Beach patent; and the existence of such machines as are referred to by Mr. Fowler for the purpose of stitching does not either show, nor hint at, the Beach invention, but as a separate and distinct object and purpose, the machines themselves being clearly distinguishable from the Beach machine, being made for a different purpose, and operating in a different way.

I do not put in any one of the above classes "Defendants' Exhibit Horton's Brush Dies," as they are only introduced to show that a flexible support has been used in connection with dies. I did not put in any one of the above classes "Defendants' Exhibit Glazier Box Press," which is merely a foot-operated press used in the manufacture of paper boxes, and having absolutely nothing to do with the Beach inventions. I believe that Mr. Fowler introduced this exhibit merely for the purpose of showing that springs were old in a press. Certainly the two exhibits, to wit: the Glazier box press and the Brush dies, have no relation whatsoever to the Beach invention. They do not show it; nor do they lead a mechanic towards that invention in view of the state of the art.

115 I am informed by counsel that I need not consider "Defendants' Exhibit Horton's Original Machine;" as that machine, I am informed, is of a later date than the invention of Beach.

"Defendants' Exhibit Hobbs' Modified" is, as I understand it, one of the defendants' machines in which some one has substituted for the male and female dies having diverging faces, which are adapted to operate on a box corner, flat dies which are adapted to operate on something other than a box corner. I have no doubt that such change can be made in the shape of the dies as the Hobbs modified machine shows; but when such modification is made the Beach invention has been departed from, because the mechanisms thus produced is no longer adapted to operate on the

corners of boxes for the purpose of attaching stay strips to those corners. As I understand the Beach patent, it is limited in this regard to a machine having as one of its elements dies suitable for this particular purpose as distinct from any other kind of dies which might be adapted to some other and different purpose. Therefore the Hobbs modified machine, which, by the way, is not an old machine, as I understand it, but a modification of the defendants' infringing machine, shows nothing in connection with this matter except that the dies which are essential to the Beach invention can be taken off, and dies which are useful for some other purpose, perhaps, put on.

This covers the entire deposition of Mr. Fowler, so far as any older art is concerned; and I must say that I fail to see why he considered the Beach patent either to be anticipated or limited by that art as he has shown it, nor why he considers that it required no invention to produce that which is shown in the Beach patent. Mr. Fowler has not produced as a part of the art a single stay-strip machine adapted for attaching stay strips to the corners of boxes. He has shown shoe machines, box machines, tag machines, and all kinds of machines; but he has not shown one example before Beach of a machine for attaching stay strips to boxes; and the art as he has shown it leaves Beach in the position of a primary and first inventor, in this regard entitled to the broadest consideration as having produced for the first time a machine which would do by mechanical means that which has hitherto been done by hand. It is immaterial to say that mechanism taken from other arts by Beach were simple mechanism well known to mechanics, because although Beach did take such simple and well-known mechanisms, he combined them into an entirely new machine, a machine which
116 never had existed before, and for accomplishing a purpose which had never been accomplished before the date of the Beach invention by machines. Therefore, he is not to be judged as would be an inventor who has merely added an improved lever or device to an old form of machine. He is to be judged in the light of a man who for the first time has produced a machine adapted for an entirely new, novel and useful purpose. Therefore, however simple his elements are, he is to be regarded as a pioneer inventor in a wholly new art, not as an improver in an old art.

Int. 5. Please briefly relate what you understand to be the combinations covered by Beach in his reissue, and in the first, second, third and sixth claims thereof.

Ans. The first claim contains three elements, the opposing clamping dies having diverging working faces, a feeding mechanism which feeds the stay strip between the clamping dies, and a pasting mechanism, the clamping dies being adapted to co-operate with one another and to press the stay strip upon the corner of the box when the said box corner is placed between the dies.

The second claim embraces the same dies, the same feeding mechanism and a cutter for severing the continuous stay strip into stay strips of the suitable lengths. The clamping dies are to perform the same action in this claim as in the first claim, to wit: they are

to co-operate with one another to press the stay strips upon the box corner when the said box is placed between the dies.

The third claim involves four elements, to wit: The opposing clamping dies, the feeding mechanism for feeding the continuous pasted strip between the dies, a pasting mechanism to apply paste to the strip and a cutter for severing the continuous stay strip into stay strips of suitable lengths. In this claim also the dies are to be so arranged as to co-operate with one another to press an adhesive fastening strip upon a box corner placed between the dies.

The sixth claim involves the same dies and the spring, or yielding device, combined with one of the dies. The dies themselves are to co-operate to press the adhesive stay strip on an interposed box corner, and the yielding capacity of one of the dies is utilized for the purpose of enabling thicker or thinner pasteboard to be used in the boxes without altering the adjustment of the machine.

Int. 6. Mr. Fowler has said that springs being old as shown in the earlier patents the application of such devices to one of the dies would not amount to invention. Please state whether you agree with him in this regard.

117 Ans. I agree with him to this extent. The application of a spring to an old piece of mechanism where the spring would be serviceable would not require invention. But in this case I think that the combination of the sixth claim is clearly distinguishable from anything in the art, because it was new to combine clamping dies having the particular form of face here recited, with a mechanism for attaching stay strips to boxes.

Now this being a new and basic discovery of Beach's, he has an entire right to combine with this new mechanism a spring as an element of the combination, if that spring performs some useful work in that combination. His combination being new, the addition of the old element thereto constitutes a novelty which would not be found were the spring merely combined with some old and well-known mechanism; and, therefore, though I agree with Mr. Fowler, generally speaking, that the addition of a spring does not involve invention, I think that in this particular case the addition of a spring did involve invention, because it is found in a combination which is wholly novel outside of the spring.

HENRY L. BREVOORT.

Circuit Court of the United States, District of Massachusetts. In Equity.

FRED H. BEACH
v.
HOBBS MFG. CO. ET AL.

Please take notice that the complainant in the above cause will proceed to take testimony therein, under the 67th rule in equity, as amended, before John A. Shields, Esq., United States commissioner, or other competent officer, on Friday, November 17th, 1893, at ten

o'clock in the forenoon, at the offices of John Dane, Jr., No. 261 Broadway, New York city.

JOHN DANE, JR.,
Solicitor and of Counsel for Complainant.

Dated New York, November 13th, 1893.

To Edward S. Beach, Esq., defendants' solicitor.

118 Names of witnesses.	Residences.
Ebenezer Spooner	New York city.
J. Day Otis	East Orange, N. J.
Charles B. Baldwin	Brooklyn, N. Y.
Charles W. Jencks	Providence, R. I.
Walter S. Barnes	Somerville, Mass.
Charles A. Brackett	West Newton, Mass.
George H. Dickerman	Somerville, Mass.
Herbert B. Chaffee	Swampscott, Mass.
William Barbour	Everett, Mass.
Mark D. Knowlton	Rochester, N. Y.

NEW YORK, *November 17th*, 1893—10 o'clock a. m.

Met pursuant to notice.

Present: Mr. John Dane, Jr., for complainant.

The examination of witnesses noticed to have been held today, is, by consent of counsel for both parties, adjourned to Monday, November 20th, 1893, at 10 o'clock a. m., to convene at same place.

NEW YORK, *November 20th*, 1893—10 o'clock a. m.

Met pursuant to adjournment.

Present: Mr. John Dane, Jr., for complainant; Mr. Edward S. Beach, for defendants.

Deposition of Ebenezer Spooner.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 14. What is your name, age, residence and occupation?

Ans. Ebenezer Spooner, age 73 years, residence No. 326 West 28th street, New York city, occupation, manufacturer of paper boxes.

Int. 2. How long have you been in the manufacture of paper boxes?

Ans. Since 1866.

Int. 3. State whether or not you are familiar with the various details pertaining to the manufacture of paper boxes, generally known to the trade, and whether with machinery for automatically staying the corner of boxes, with paper, muslin, etc.?

Ans. I am.

119 Int. 4. Who, if you know, produced the first machine for automatically staying the corners of boxes with paper, muslin, etc.?

Ans. The first I ever know of, was a machine invented by Fred H. Beach.

Int. 5. How familiar are you with the said Beach machine for staying the corner of boxes, and what can you say as to its value?

Ans. I have had such machines in use ever since they were first introduced to the public. I consider the invention a great labor-saving machine as well as a machine capable of doing better work, more uniform, and in a manner far superior to what is or was possible by any means known to the trade prior to the said invention by Mr. Beach. As to the labor saving, a boy with the Beach machine will set up 6,000 boxes, as against 1,000 in the same time set up and finished by the best methods known to the trade, prior to the invention of Beach. By the use of the machine, the stay strip is made to adhere with a much greater degree of firmness than is possible when put on by hand, and a greater degree of uniformity and superior finish is given to the box corners than was possible than by any of the methods known, prior to the Beach invention. It is a machine that no firm or concern engaged in the paper-box-making business can afford to be without, and its usefulness, and great value, has given it a reputation and prominence in nearly all of the leading box-making establishments in the country. I have no interest whatever in the result of this action, and am not in anywise related to the said complainant.

Int. 6. Where is your factory located?

Ans. At No. 252 West 27th street, N. Y.

Int. 7. Do you manufacture for the trade generally? and are the boxes made by your concern of varied kinds of paper, pasteboard, etc.?

Ans. Yes, to both branches of the question.

Cross-examination by Mr. BEACH:

Cross-int. 8. When were the Beach machines first introduced to the public?

Ans. Well, I could say prior to 1888, but do not know the year.

Cross-int. 9. You have stated that you considered the invention a great labor-saving machine, as well as a machine capable of doing better work, more uniform and in a manner far superior to what is or was possible by any means known to the trade prior to the said invention by Mr. Beach. Now please state what the means referred to by you were.

120 A. Staying the corners by hand, with either paper or muslin.

Cross-int. 10. How was that hand work done? Describe the method and operation.

Ans. Paper or muslin spread on the table and pasted or glued, taken by hand and put on the corners of boxes by the fingers.

Cross-int. 11. And pressed nicely and neatly by hand pressure?

Ans. Yes, sir.

Cross-int. 12. The box corner at this time was supported on a-angular support, was it not, inside the box?

Ans. It was not.

Cross int. 13. Well, how else were box corners stayed before you became acquainted with the Beach machine?

Ans. The pieces of paper and muslin were put on by hand, as I have said before.

Cross-int. 14. Do you mean that there was no other way known to you, of giving strength and rigidity to paper-box corners, prior to the advent of the Beach machine?

Ans. No.

Cross-int. 15. Now what other ways were there, prior to the advent of the Beach machine, of giving strength and rigidity to paper-box corners?

Ans. None.

Cross-int. 16. Are you quite sure of that?

Ans. I know of none.

Cross-int. 17. Never heard of the Cohn machine for inserting corner clasps on box corners?

Ans. No, sir; I never heard of it.

Cross-int. 18. Have you ever heard of the Lasch box-stapling machine?

Ans. I knew of none at the time. The wire stapling machines have come up since.

Cross-int. 19. The Beach machine, then, simply does mechanically what was theretofore done by hand, so far as your personal knowledge is concerned; is that correct?

Ans. Yes.

Cross-int. 20. How many Beach machines have you in use?

Ans. Three.

Cross-int. 21. How long have you had them?

Ans. These that we have got now are the improved machines.

Cross-int. 22. How long have you had these improved machines?

121 Ans. Three or four years; perhaps more.

Cross-int. 23. Did you have some of Beach's machines before you got the Beach improved machine?

Ans. Yes.

Cross int. 24. What was the matter with the first Beach machines that you had?

Ans. They got worn and didn't do the work properly.

Cross-int. 25. When did you get the first machine?

Ans. Prior to 1888. I cannot say exactly.

Cross-int. 26. How many of them did you have?

Ans. Two.

Cross-int. 27. Who sold you the Beach machines? The original ones?

Ans. Fred H. Beach.

Cross-int. 28. Who sold you the improved machines?

Ans. Fred H. Beach.

Cross-int. 29. When you found that the first machines that Mr. Beach sent you didn't do the work properly, what did you do?

Ans. Stayed corners by hand, as formerly.

Cross-int. 30. How long did you keep on staying boxes by hand before you got the improved machine?

Ans. I could not say how long.

Cross-int. 31. Did Mr. Beach come to see you about the matter?

Ans. Yes.

Cross-int. 32. And was very anxious, I suppose, that you should take some of the improved machines?

(Question objected to as improper in form, and not cross-examination.)

Ans. Yes.

Cross-int. 33. Did he come to see you often about taking the improved machines?

(Same objection.)

Ans. Occasionally, when he was in the city.

Cross-int. 34. How did the improved machines differ from the Beach machines that you had abandoned?

(The question is objected to as improper and presumptuous, inasmuch as the witness has not stated that the machines were abandoned.)

Ans. They were much heavier and stronger and differently built.

Cross-int. 35. Did you pay anything for the original machines?

Ans. Yes.

122 Cross-int. 36. And they failed to do the work properly?

(Question is objected to as improper, obviously an attempt to mislead the witness, and as surreptitious.)

(Counsel for defendant suggests that it is not the ordinary practice of manufacturers to buy a machine, and give up their use and go back to hand methods, unless there is some failure of the machine to work properly, and submits to the court that the question is a proper one.)

(Complainant's counsel in reply states that the witness has already testified in his answer to cross question 24, that the Beach machine referred to got wore (or wear) and didn't do the work properly, and it is obvious to counsel and certainly must be to the court, that when a machine becomes worn by use, so as to do its work improperly, it is no evidence that the machine was a failure when new and during a reasonable time after being first set up for practical use, consequently, counsel reiterates that the question is improper, and in nature tending to mislead.)

Ans. Yes.

Cross-int. 37. How much did you pay for the first Beach machine?

(Question objected to as immaterial and irrelevant.)

Ans. I do not remember.

Cross-int. 38. What terms did Mr. Beach make with you when you took the improved machine?

Ans. I don't remember.

Cross-int. 39. What did you do with the original machines after you gave up their use?

Ans. I used one of the frames by Mr. Beach's consent for an entirely different purpose. The other machine was boxed up and delivered by Mr. Beach's order to a man, I think, by the name of Sargent.

Cross-int. 40. Did Mr. Beach make you some pretty liberal terms when you took the improved machines in place of those which you discarded?

(Question objected to as immaterial and irrelevant.)

Ans. I do not know, for I did not make the arrangements.

Cross-int. 41. What were the arrangements?

Ans. I do not know.

Cross-int. 42. Who made the arrangements?

Ans. My nephew, Edward A. Spooner.

Cross-int. 43. Was it about 1888 that you got the improved machines? I want you to give the date just as near as you can.

123 Ans. I cannot give any date.

Cross-int. 44. Can you get the date at your place of business?

Ans. Knowlton & Beach can give you the date better than I can, for they know when they sold me the machine.

Cross-int. 45. I will ask you to produce the date if you can. Will you do so?

Ans. I will if I can.

Redirect examination by Mr. DANE:

Redirect Int. 46. Mr. Spooner, state whether or not you used in a practical way the two first Beach corner-staying machines procured from Mr. Beach as you have testified, and if yea, about what length of time, as near as you can now recollect.

Ans. We did use them in a practical way, and for several years.

Redirect cross-int. 47. And it was by reason of the several years' use that the machines got "wore," as testified in your cross-int. 24?

(Question objected to as misleading.)

Ans. Yes.

Redirect Int. 48. And during the several years to which the two machines were subjected to practical use, as you have stated, what particular work did the machines perform in their operation upon boxes?

Ans. Putting strips of paper or muslin upon the corners of boxes.

Redirect Int. 49. And during the years that you so used the machines, was the staying of the corners by the Beach machines satisfactory or not?

Ans. They were until the machines got wore out.

(Recross-examination by Mr. BEACH:)

Recross-int. 50. Can't you state more definitely the length of time that you had the original Beach machines in use?

Ans. I cannot.

Recross-int. 51. Did you have them in use as early as January 1st, 1883?

Ans. I cannot answer without reference to books, that I cannot see at present.

Recross-int. 52. Were the first Beach machines that you had as rapid in operation as the improved Beach machines?

Ans. About the same.

Recross-int. 53. I will ask you to refer to such books or other sources of information as may refresh your memory, and before the close of this deposition, be prepared to state positively when
124 you got the first two machines from Beach, how long they were used by you, the date when they were discarded, the length of time thereafter that you stayed box corners by hand, and the date of your getting the improved machines; will you do so?

Ans. Impossible.

Recross-int. 54. Why impossible?

Ans. It was then the Spooner Mfg. Co., which company has failed, and the books are out of my, or our possession.

Recross-int. 55. Where are the books?

Ans. Many of them have been sold, and I don't know where to seek that information. Mr. Beach, of Knowlton & Beach, can give you better dates than I can.

Recross-int. 56. When those two machines that you first had from Beach failed to do their work properly, why didn't you send right off to Beach for new machines. How was it that for a period thereafter you stayed box corners by hand?

Ans. Why, sir, the boxes could not be stayed on two machines, (which was all we had), fast enough for a factory employing as many hands as we did. We had to constantly set up boxes by hand to keep going.

Recross-int. 57. I understand you to have already testified, that after you gave up the use of both the original Beach machines, you went back to the hand process and practiced that for a considerable period, and that after a while, at Mr. Beach's solicitations, you got three improved Beach machines. Now why was it that you were contented to stay box corners by hand for a period after you gave up the use of the first two Beach machines?

Ans. We have always had to stay corners of boxes by hand during all the time of the Beach machines, and do now, with the use of the improved Beach machines, still set up boxes by hand, as required at times.

Recross-int. 58. So the Beach machines has not displaced or superseded the hand method of staying box corners by pasting strips of paper or muslin over the corners?

Ans. Not in all cases. For we may have boxes that are too long or too deep for the machine to stay the corners, consequently they have to be done by hand.

Recross-int. 59. Well, won't you explain to me just what the limitations of the Beach machine are, practically speaking, as regards the sizes of boxes, whose corners are to be stayed by pasted strips of muslin or paper?

125 Ans. From two and a half to three inches deep.

Recross-int. 60. Well, why is it that if the boxes are more than from two and a half to three inches deep, that you can't use the Beach machines practically for staying box corners?

Ans. Where a box is nine inches deep, you cannot stay the corners on any machine, it has to be done by hand. The Beach machine will not reach or feed more than three inches.

Recross int. 61. What is the reason of that?

Ans. The machine is only made to feed the paper or muslin only three inches long.

Recross-int. 62. Three inches then is the limit of the practical feed of the stay piece. Is that so?

(The question is objected to as asking the witness to assume the province of a machine-builder, or one skilled in the construction of such and similar machines, and therefore incompetent and improper, as there is nothing in his testimony that shows or tends to show that he is a machinist, or sufficiently acquainted with the construction of machinery to testify, as to the capacity, or the extent of the capacity to which such corner-staying machines may be carried, or made to embody.)

Ans. Of the machines that we have, it is.

Recross-int. 63. Suppose that any one of the Beach machines that you have had a box support nine inches long, and a plunger of the same length, and a nine-inch feed, and that nine inches of stay strip with paste or gum on its under side, were projected over the interposed box corner, do you think judging from your own personal experience with pasted strips as regards curling or tendency to curl, and taking into consideration the action of gravity on the stay strip, that the machine would be a practical one?

Ans. I do.

Recross-int. 64. Without the addition of any new mechanism?

Ans. New mechanism would have to be added to the machine that we have.

Redirect examination by Mr. DANE:

Redirect Int. 65. Is it a usual or customary thing to make boxes of nine inches in depth in any considerable quantities for the trade?

Ans. It is and deeper.

Redirect Int. 66. In speaking of the feed of the machine, for box-staying, being only three inches long, as stated in your answer to cross-interrogatory 61, I ask you to state whether or not you
126 referred more particularly to the machine or machines used by you or your concern?

Ans. Yes; I referred to our machines.

EBENEZER SPOONER.

(1.30 p. m., adjourned for recess to meet at 2.30 o'clock p. m.)

NEW YORK, *November 20th*, 1893—2.30 o'clock p. m.

Met pursuant to adjournment.

Present: Counsel as before.

Deposition of J. Day Otis.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. J. Day Otis, age 55 years, residence East Orange, N. J., occupation, paper-box manufacturer. Place of business, at Nos. 168 and 170 South 5th avenue, near Broome street, New York.

Int. 2. How long have you been in the manufacture of paper boxes?

Ans. Fourteen years.

Int. 3. State whether or not you are familiar with the various details pertaining to the manufacture of paper boxes generally known to the trade, and whether, with machinery for automatically staying the corner of boxes with paper, muslin, etc.

Ans. Yes; I am.

Int. 4. Who, if you know, produced the first machine for automatically staying the corner of boxes with paper, muslin, etc.?

Ans. The first I ever knew of was a machine invented by Fred H. Beach.

Int. 5. What familiarity have you had with the Beach machine for staying the corners of boxes, and what can you say as to its importance and value?

Ans. We have had it in use about eighteen months, and we find its value to us from seven to ten dollars a week. Its importance consists in the fact that it will do five or six times the work that can be done by hand.

Int. 6. What methods were adopted by the manufacturer of paper boxes for staying the corners by strips of paper or muslin, prior to the Beach invention, in controversy here?

Ans. The paper or muslin was laid down on the table in strips pasted off by the girl, and in the case of muslin was cut into small squares and the work set up by hand.

127 Int. 7. In what manner was the stay strip after the cutting and pasting by hand, as you have stated, secured to the corner of the box?

Ans. The girl took the piece of paper or muslin in her hand, took the box in the other, and then by pressing it on to the corner, secured it.

Int. 8. How did the work of staying the corner of boxes by hand compare with that done by the Beach machine—which did you find to be the most reliable and to serve to give the best finish?

Ans. That depended upon the ability of the girl, but the results were generally in favor of machine-work.

Cross-examination by Mr. BEACH:

Cross-int. 9. How did you come to get the Beach machine?

Ans. We had seen it in operation in other factories, and thought it would be to our advantage to have one.

Cross-int. 10. Has the machine been pretty generally advertised?

Ans. I could not say as to that; they were certainly very well known in the trade.

Cross-int. 11. From whom did you get the machine?

Ans. From Knowlton & Beach.

Cross-int. 12. I suppose you have found them pretty energetic and strenuous about introducing their machines?

(Question objected to as immaterial, irrelevant and improper.)

Ans. I could not say as to that. In our case they called on us at our request.

Cross-int. 13. Was the machine put in on trial?

(Question objected to as immaterial.)

Ans. No, sir.

Cross-int. 14. The paper-box corners had been stayed for many years prior to the advent of the Beach machine otherwise than by strips of muslin and paper, had they not?

Ans. Yes, sir.

Cross-int. 15. How?

Ans. Generally by the use of wire stitching.

Cross-int. 16. How otherwise?

Ans. Occasionally metal corners.

Cross-int. 17. By wire stitching you mean wire staples, do you not?

Ans. No, I mean wire stitching.

128 Cross-int. 18. Don't you remember the wire-stapling machines?

Ans. No.

Cross-int. 19. Please describe the operation of the Beach machine that you have.

Ans. The paper or muslin is placed on a roll and fed from that by traction, over a wheel running through a vat of mucilage. This moistens the gum already on the paper and prepares it to adhere to the box. It then passes between a guide which slightly bends it to prevent curling, and then in that shape passes onto the anvil, where it meets the box or cover that it is intended to stay, and then by pressure applied from above it is made fast to the box or cover.

Cross-int. 20. And then a projecting end of the stay strip is turned down and subsequently turned into the inside of the box, is it not?

Ans. It is not.

Cross-int. 21. Hasn't your Beach machine a down-turner, and an in-turner?

Ans. I don't understand what you mean by those terms.

Cross-int. 22. Hasn't your Beach machine an angular box support?

Ans. I don't understand that term.

Cross-Int. 23. Is the box or cover the corner of which is to be stayed, supported on anything during the operation of the machine?

Ans. It is supported on what I previously termed the anvil.

Cross-int. 25. And that anvil has an angular supporting surface, hasn't it?

Ans. Yes.

Cross int. 26. And above the anvil there is a plunger, with a V-shaped notch in its lower surface?

Ans. There is a plunger, I don't remember about the notch.

Cross int. 27. Now, isn't there in your Beach machine, in addition to the anvil and the plunger to which we have referred, an additional plunger, that comes down to bend a projecting end of the severed stay strip, over the outer edge of the box, and then a reciprocating plunger that catches the down-turned end or the stay strip, and pushes it inside the box, so that the box corner has a stay strip upon its outer surface, and over the edge and on the inside?

Ans. No.

129 Cross-int. 28. Do you stay all the box corners which you stay by strips of muslin or paper, on your Beach machine?

Ans. No.

Cross-int. 29. How is that?

Ans. Because we have only one machine.

Cross-int. 30. Do you make any boxes, the corners of which are stayed by pasted pieces of paper or muslin, that could not be stayed on your Beach machine?

Ans. Our machine only takes in three inches, and we make a great many boxes and covers deeper than that.

Cross-int. 31. What is your annual output of boxes that are more than three inches deep?

Ans. I couldn't say.

Cross-int. 32. About what?

Ans. I couldn't say.

Cross-int. 33. About what is your annual output of boxes that are three inches or less in depth?

Ans. That I couldn't say.

Cross-int. 34. Dividing the boxes made by you, the corners of which are stayed by pasted strips of muslin or paper, into two classes. First, those which are three inches or less in depth, and second, those which are more than three inches in depth—which do you make the more of?

Ans. Very much more of the first class, those under three inches.

Cross-int. 35. As I understand it, there is in your Beach machine, a guide to prevent curling?

Ans. Yes, sir.

Cross-int. 36. What harm would the curling do?

Ans. I don't know that it would do any.

Cross-int. 37. Your Beach machine is known to you as Beach's improved machine, is it not?

(Question objected to as immaterial.)

Ans. Not that I know of.

Redirect examination by Mr. DANE:

Redirect Int. 38. State whether or not you have had any experience in the construction of machinery, generally.

(Question objected to on the ground that the cross-examination has not touched upon the witness' experience in the construction of machinery.)

Ans. No.

130 Redirect Int. 39. State whether or not you are familar with the terms used by mechanics generally, as applied to various parts of machines, of varied structures?

(Question objected to as immaterial and irrelevant and inadmissible, because not relating to anything brought out on the cross-examination.)

Ans. Tolerably so.

Redirect Int. 40. You have had no experience as a machinist?

(Question objected to as leading.)

Ans. Not outside of our own factory.

Redirect Int. 41. And that experience consists of what?

Ans. Directing of proper repairs to machinery when it is out of order.

J. DAY OTIS.

(Adjourned to Tuesday, November 21st, at 10 o'clock a. m., to convene at same place.)

NEW YORK, *November* 21*st*, 1893—10 o'clock a. m.

Met pursuant to adjournment.

Present: Counsel as before.

Deposition of Charles B. Baldwin.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Cross-int. 1. What is your name, age, residence and occupation?

Ans. Charles B. Baldwin, age 29 years, residence No. 163 Joralemon street, Brooklyn, N. Y.; occupation, paper-box manufacturer.

Cross-int. 2. About what length of time have you been more or less familiar with the box-making business, particularly in the paper-box class?

Ans. About 15 years.

Cross-int. 3. About what length of time have you been actively engaged in the box-making business, and where?

Ans. For the past eight years, at No. 138 Fulton street, New York city.

Cross-int. 4. What is the style or name of the concern with which you have been, and are now connected?

Ans. Eli Baldwin & Son.

Cross-int. 5. In the manufacture of boxes at your establishment, state whether or not paper boxes of your production, or any
131 of them are stayed or reinforced at their corners, by means of a separate strip for that purpose.

Ans. They are.

Cross-int. 6. How are such strips applied and secured upon the corner of such boxes, that is, by what means?

Ans. Majority of them are put on by the Beach staying machine.

Int. 7. What Beach do you refer to, in your last answer?

Ans. His name is Fred H. Beach, of Rochester, N. Y.

Int. 8. About when first did you commence the use of the Beach staying machine at your factories?

Ans. In the fall of 1889.

Int. 9. About how long did you continue in the use of such machines, and particularly with such as you commenced with in 1889?

Ans. We have used the same machine continuously, to the present time.

Int. 11. Prior to the use of the Beach corner-staying machine, at your factory, how were such stays applied to the corners of the boxes?

Ans. By hand.

Int. 12. From the experience had at your factories with hand work, and the machine work, in applying such stay strips to the corners of boxes, which method have you found to be the best?

Ans. By the use of the machine.

Int. 13. You may tell the court, if you please, the advantages of the machine application of the stay strips over that usually done by hand.

Ans. The corners of boxes are stayed more rapidly and at less expense, more securely and more uniformly, and in such a manner that the boxes can be handled immediately after the corners have been put on.

Int. 14. How about the character or finish, as between that done by hand and that done by the Beach machine—which is the best?

Ans. The finish of the corner done by the Beach machine is far superior to hand work. It cannot be equaled by it.

Int. 15. In your answer to the thirteenth question, you have stated in substance that the boxes that have been stayed by the Beach machine can be handled immediately after the corners have been put on; could you not handle the boxes quite as readily where the corner stays were applied by hand, and if nay, why?

132 Ans. No. With corners stayed by hand it is necessary for the boxes to stand until the corners have become dry. The Beach machine acts in such a way that the corners are dry enough to handle at once.

Int. 16. State whether or not you have known of any machine capable of staying the corners of boxes with a reinforce strip of paper or muslin over and upon the corners of boxes prior to the invention by Fred H. Beach?

(Question objected to, because it doesn't appear that the witness knows when Beach made the invention.)

Ans. The machine invented by Fred H. Beach is the first machine about which I know for the purpose of staying the corners with paper or muslin.

Int. 17. What, if any machine, have you had acquaintance with that was capable of or was used to fasten the corners of boxes together, not a stay strip of paper or muslin?

Ans. I have seen machines which fastened the corners together with wire.

Int. 18. What can you say as to the importance of the method referred to in your last answer as applied to paper boxes?

Ans. I have never considered the method a good enough one to use at our factories.

Int. 19. Have you had any experience with boxes, the corners of which were or had been secured by the wire process?

Ans. Yes. We have frequently been called upon to make boxes by other methods to take the place of those stayed with wire.

Int. 20. Do you know of any method for staying the corners of paper boxes with strips of paper or muslin, that equals the method accomplished by the Beach machine?

Ans. No.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Cross-int. 21. Are you a member of the firm of Eli Baldwin & Son?

Ans. No.

Cross-int. 22. What is your position there?

Ans. Superintendent.

Cross-int. 23. You have had your Beach machine about four years?

Ans. Yes.

Cross-int. 24. You use on your Beach machine a coil of previously gummed stay strips, do you not?

133 Ans. Not always. We use both gummed and ungummed strips.

Cross-int. 25. How long have you been superintendent there?

Ans. Five years.

Cross-int. 26. How did your concern come to get the Beach machine?

(Question objected to as immaterial.)

Ans. It was purchased on my recommendation.

Cross-int. 27. How did you come to recommend it?

(Same objection.)

Ans. From seeing the work which it performed, and for the other reasons that I have given in my previous answers.

Cross-int. 28. You know, Mr. Beach, do you not, the complainant?

Ans. Yes.

Cross-int. 29. And his partner Mr. Knowlton?

Ans. Yes.

Cross-int. 30. Which one of them came to see you about the machine before you recommended it to your concern?

(Question objected to as immaterial.)

Ans. Neither one of them.

Cross-int. 31. No agent of theirs?

(Same objection.)

Ans. Yes, an agent induced us to try one of their machines, and it was recommended by me on its merits after a trial.

Cross-int. 32. Who was that agent?

(Question objected to as immaterial.)

Ans. I think his name was Thayer.

Cross-int. 33. Thayer was pretty anxious to have your concern adopt the machine, wasn't he?

(Question objected to as immaterial and irrelevant and incompetent.)

Ans. No more anxious than I am to sell boxes.

Cross-int. 34. Now what were those special inducements in the way of discounts and the like to your concern, that Thayer was willing to make to get your concern to adopt the Beach machine?

(Question objected to as improper, presumptuous, nothing appearing by the evidence of this witness justifying such a proposition.)

Ans. There were no inducements offered in the way of discounts and the like. The machine was purchased at the full price, because of its merits.

Cross-int. 35. How many times did Thayer come to see you about it?

134 (Question objected to as immaterial.)

Ans. I couldn't say, maybe two or three times.

Cross-int. 36. If the Beach machine is such an excellent contrivance, I suppose that there are a good many of them in use, do you know about that, or can you state whether Messrs. Knowlton and Beach have been active or inactive to secure the adoption of their machines?

(Counsel for complainant states that he objects to the character of the question generally, and that it is not proper cross-examination,—moreover it follows as a matter of fact based upon the ordinary methods of business properly attended to, that it is for him or them, who first discovers or invents a thing or matter to let the public know of his invention, discovery or matter, by introducing the same, either by personal solicitations, through agents, advertising and others of the usual channels, generally adopted by business-like, intelligent men, consequently, the question is further objected to as frivolous.)

(Counsel for the defendants repudiates the charge of frivolity, and submits in view of those decisions of the United States Supreme Court which holds that attempts to bolster up a case characterized by an attenuated paucity of invention, if any, through proof of utility, are negative by evidence of the patent owner's energy in pushing this business, by the fact of advertising, etc., this line of cross-examination is not frivolous, but is material and relevant.)

Ans. I presume that there are a good many of them in use, because since purchasing the first one we have put in two others, and suppose that Messrs. Knowlton & Beach have met with similar experience with other box manufacturers. I have no means of knowing as to the activity of Knowlton & Beach to secure the adoption of their machines.

Cross-int. 37. Are the Beach machines which you have all alike in the construction and mode of operation?

Ans. Yes, with the exception of a few improvements.

Cross-int. 38. How long have you had the last two machines?

Ans. We have had one three years. The last one about a month or two, I don't know which it is.

Cross-int. 39. What are the improvements to which you refer?

Ans. In the formation of various adjusting screws, and in the formation of a few of the parts, but which do not alter the operation of putting on the staying.

Cross-int. 40. Why, then, do you call them improvements?

135 Ans. Because they render the adjustment of the machine easier to the operator.

Cross-int. 41. And insure a better quality of work, or a greater uniformity of product?

Ans. I should say not. The original machine which we put in does work of an equal quality to the later machine. We use the machines on the same class of work.

Cross-int. 42. Are those Beach machines, or any one of them, adapted to turn down a projecting end of the stray strip and then turn it inside the corner?

Ans. Yes.

Cross-int. 43. All of them?

Ans. No, one of them.

Cross-int. 44. Which one of them?

Ans. The last one.

(1.30 p. m. adjourned for recess, to meet at 2.30 o'clock p. m.)

2.30 O'CLOCK P. M.

Met pursuant to adjournment.
Present: Counsel as before.

Cross-int. 45. You say that with corners stayed by hand it is necessary for the boxes to stand until the corners have become dry, and the Beach machine acts in such a way that the corners are dry enough to handle at once. Isn't this simply because there is less paste applied by the machine than is apt to be applied by hand?

Ans. No. It is owing to the pressure which the machine gives that the corners are stuck fast at once.

Cross int. 46. What is the greatest depth of boxes that the Beach machines can practically stay the corners of?

(Question objected to as incompetent and improper.)

Ans. I know of no reason why there should be any limit to the depth of the box, providing the machine was built large enough.

Cross-int. 47. What are your machines limited to?

Ans. Three inches.

Cross-int. 48. You make a great many boxes, don't you, that are more than three inches deep?

Ans. Yes.

Cross-int. 49. You stay their corners by hand, with pieces of muslin or paper?

136 Ans. In part. It is usually the custom in making boxes of greater depth than three inches to construct them in a different way from those of only three inches in depth.

Cross-int. 50. All the foregoing answer after the words "in part" are objected to as voluntary.

Cross-int. 51. How long have you known Fred H. Beach?

(Question objected to as immaterial.)

Ans. About four years.

(Redirect examination by Mr. DANE:)

Redirect Int. 52. You have stated, in answer to cross-question 24, "that you use on your Beach machine both gummed and ungummed strips." Please explain to the court what you mean by the term "gummed and ungummed strips," as used in connection with the question referred to?

Ans. By gummed strips I mean strips which are coated on one side with gum before using in the machine. By ungummed strips I mean strips of paper with nothing on their surface previous to their use in the machine.

Redirect Int. 53. And during the operation of the machine and the feeding of the ungummed strips toward the apparatus for severing the strip, how is the pasting material applied?

Ans. By means of a paste-pot and wheel, automatically.

Redirect Int. 54. About how long has the establishment with

which you are connected been engaged in the manufacture of boxes?

Ans. About 45 years.

CHAS. B. BALDWIN.

The examination of witnesses is hereby adjourned by consent of counsel for both parties hereto, to the office of Edward S. Beach, Esqr., No. 53 State street, Boston, Mass., room 535, at 10 o'clock a. m., Thursday, November 23rd, 1893.

Circuit Court of the United States, District of Massachusetts.
In Equity.

FRED H. BEACH
v.
HOBBS MFG. CO. ET AL.

It is stipulated that Charles P. Searle, Esq., notary public of Boston, Mass., act as special examiner herein for the taking
137 of depositions in behalf of complainant; also John A. Shields, Esq., U. S. commissioner of New York.

Boston, Oct. 24th, 1893.

JOHN DANE, JR.,
Sol. for Complainant.
EDWARD S. BEACH,
Sol. for Defendants.

BOSTON, MASS., *Nov. 23d*, 1893.

Met pursuant to an adjournment taken at New York city, on the 21st November, 1893.

Present: Counsel as before.

Deposition of Charles W. Jencks.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. Charles W. Jencks; 67; Providence, R. I.; paper-box manufacturer.

Int. 2. How long have you been engaged in the business of manufacturing paper boxes?

Ans. Forty-one years.

Int. 3. What other party or parties that you know of that have been longer in the business than yourself?

A. Only one, Plumly, of Philadelphia, as I understand it.

Int. 4. Then, if I understand you correctly, you are the oldest manufacturer of paper boxes in the New England States? Is such the fact or not?

Ans. Why, I think it is. I know of none older.

Int. 5. What opportunities, if any, have you had to enable you to become more or less acquainted with the box manufacturers of New England?

Ans. The main opportunity is being vice-president of the Paper Box Makers' Association, and dealing with many of them.

Int. 6. State the object of the Box Makers' Association, and at the same time what territory is embraced within the association referred to.

Ans. To get acquainted with each other, to confer on matters pertaining to the business, etc. The territory embraced is the New England States.

138 Int. 7. To what extent, if any, are the leading manufacturers of paper boxes within the New England States members of the association referred to? And the character of its membership?

Ans I cannot give the proportion of members. I think we have about 75 names of the leading manufacturers of New England.

Int. 8. In the manufacture of paper boxes at your establishment, what means are adopted for the staying of the corners of the boxes and the covers thereof, with stay strips of muslin and paper to reinforce and to strengthen the corners of such boxes?

Ans. In several ways. Ninety-nine per cent. is done by Knowlton & Beach machine, a very few by hand, and some by wire.

Int. 9. What was the first machine known to you that was capable of feeding from a reel a ribbon of paper or of muslin, and directed to the corner of a box, and automatically attached thereto?

Ans. Knowlton & Beach's.

Int. 10. For about what length of time, or when first did you know of the Knowlton & Beach machine, and when first did you begin the use of such at your establishment?

Ans. I have used it from three to five years, and knew of it perhaps a year before that time.

Int. 11. Please state briefly as you can its operation.

Ans. The paper or cloth is fed from a roll passing over a roll embedded in paste or other substance, then passes on to the corner of the box, and is pressed down by a very heavy pressure, which retains it firmly in its place.

Int. 12. How is the strip disconnected from the roll or ribbon-like strip, as it is fed to the corner of the box; how is it severed?

Ans. Automatically by a knife or shears.

Int. 13. How is the corner of the box rested while the stay strip is being attached?

Ans. On what we call the anvil of the machine.

Int. 14. What contrivance compresses the strip onto the box corner?

Ans. A plunger presses heavily upon it, retaining it firmly in its place.

Int. 15. What is the form of the anvil and of the plunger which you say act upon the corners of the box?

139 Ans. The top of the anvil is an exact square; the plunger a hollow square which fits it.

Int. 16. Prior to the introduction and use of the Beach machine for staying the corners of boxes, how were such strips of paper and

muslin usually applied upon and secured to the corners of such boxes?

Ans. They were pasted and applied one by one with the fingers, and pressed by the same.

Int. 17. How did the work done in the manner indicated in your last answer, compare with the work of a similar character done by the Beach machine automatically?

Ans. I think a boy in two hours would do as much work as a girl did all day, but her work bore no comparison to the work done on the machine, being much better, on the machine?

Int. 18. As to uniformity and regularity of the work done by the machine, how does it compare with that done by hand?

Ans. Machine-work infinitely better.

Int. 19. Prior to the introduction of the Beach machine, what was the character of the hand-work, in the staying of the corners of boxes, as to the uniformity and regularity of the position of the strip applied, and as to liability of misplacement or disarrangement in the process of applying such strips by hand?

Ans. They were liable to slip, being without pressure, and a stronger glue was obliged to be used in place of a cheap paste, when done by hand.

Int. 20. In the application of stay strips upon the corners of boxes by hand, state whether or not difficulties arose from the lack of proper uniformity of pressure applied by the fingers by way of disintegration or the lack of being properly or sufficiently stuck.

Ans. Difficulties did arise, and great pains had to be taken in rubbing down the corners to make them adhere.

Int. 21. How does the work done by the Beach machine compare in the character of the work done by hand alluded to in your last answer?

Ans. The machine-work is very much better and stronger.

Int. 22. As to the importance and desirability of the Beach machine considered in the light of the art as it existed prior to its introduction, what can you say concerning its desirability and importance to the trade generally?

Ans. I don't see how we could get along without it.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

140 Cross-int. 23. Are those wire machines of yours wire-stapling machines?

Ans. Yes.

Cross-int. 24. How long have you known them to be in use?

Ans. I should say five years; I have no means of fixing upon the time.

Cross-int. 25. What is the name of the wire-stapling machine that you have?

Ans. I cannot recollect; it is an English machine.

Cross-int. 26. State all you know about it. How did it get into this country; how long have you had it?

(The question is objected to as immaterial and irrelevant, as the issues in the pending controversy in which the witness is testifying does not in anywise involve machines of the character referred to by the respondent's counsel.)

Ans. I think about four years; I don't know how it got into the country.

Cross-int. 27. Where did you get it?

Ans. I bought it in Philadelphia.

Cross-int. 28. Of whom?

Ans. Of Hugo Bilgrim.

Cross-int. 29. You have a coil of wire in that machine, I suppose?

Ans. A spool.

Cross-int. 30. There are some intermittent feed-rollers?

Ans. I don't know, I am sure.

Cross-int. 31. How is the box corner stayed on that wire machine of yours?

Ans. Stayed by the wire.

Cross-int. 32. One leg of the staple goes through one side of the box, and another leg through the other side, and the body of the staple is across the box corner, is it not?

Ans. Yes.

Cross-int. 33. And in this English machine the box is supported on an anvil of the same shape as that in the Beach machine, is it not?

Ans. No.

Cross-int. 34. What is the shape of the anvil in your English machine?

Ans. Square, I think, on the top.

141 Cross-int. 35. It has a plunger, hasn't it, that guides the staple, and the plunger has a V-shape notch in its lower face?

Ans. I am unable to answer that question. I think it is two slight fingers.

Cross-int. 36. Please look at "Defendants' Exhibit Hadden's English Patent of 1884," and state if that figure would seem to illustrate this machine you have?

Ans. Nothing like that.

Cross-int. 37. Is Hugo Bilgram still in business, do you know?

(Objected to as immaterial and irrelevant, and not cross-examination.)

Ans. Not in that business. I think he is in the general machinery business.

Cross-int. 38. How long have you known of machines capable of feeding from a reel a stay piece of any kind whatever, and directed to the corner of a box, and automatically attached thereto?

Ans. I should say five years.

Cross-int. 39. It was common before the introduction and use of the Beach machine, was it not, to stay box corners by wire staples, and also pieces of sheet metal, as well as by hand-applied pieces of paper or muslin?

(The question is objected to as immaterial and irrelevant, as such machines are not embraced within the class to which the Beach invention belongs.)

Ans. I should say that they were only applied by hand before the introduction of this machine.

Cross-int. 40. Don't you remember machines long before the introduction and use of the Beach machines, which automatically stayed box corners by wire staples, and also by pieces of sheet metal bent over the box corners and secured to the sides of the box?

Ans. I only knew the wiring machine about a year before I bought a Knowlton & Beach machine, and knew nothing about pieces of metal on the corner of boxes.

Cross-int. 41. Will you describe the cutting-off mechanism in your Beach machine?

Ans. One knife is a circular piece of steel, with a V cut the whole length of it; the other knife is a flat knife with a V-cutting edge.

Cross-int. 42. How are they actuated?

Ans. By steam power.

142 Cross-int. 43. By what means?

Ans. By means of a belt.

Cross-int. 44. How are they actuated in the machine. Describe their connection with the other parts?

Ans. I can only say that the upper shear passes by the lower shear, forming a cutting edge.

Cross-int. 45. That is true of all shears. What I want to know is how the shears in your Beach machine are constructed and actuated in relation to the other parts of the machine?

Ans. I am not mechanic enough to answer that.

Cross-int. 46. You are not a mechanic at all, are you?

Ans. No, sir.

Cross-int. 47. And don't pretend to understand mechanism?

(Objected to as improper, particularly in view of the answers already made by the witness, respecting his knowledge of mechanics.)

Ans. Only theoretically.

Cross-int. 48. I suppose a perfectly careful hand operator would stay box corners with pieces of paper or muslin with absolute neatness, uniformity, regularity, and practical success?

(The question is objected to as it is not a question as to what may be done, by a careful operator, taking sufficiently of time, within which to carefully fix up the corner of a box to pass inspection or, in other words, to show a satisfactory result, so far as uniformity and regularity of the applications so made, but for practical purposes, in the construction of boxes at prices to be sold upon the market or to the trade generally, cost is of vital importance; therefore, as to what a skilled operator might perform, by taking sufficient length of time, is hardly a fair proposition under the circumstances. Therefore the question is improper as well as immaterial.)

Ans. I think the supposition wrong. I haven't found such a one in forty-one years.

Cross-int. 49. You knew the Beach machine about a year before you got it?

Ans. Yes, sir.

Cross-int. 50. How did you come to get it? From whom did you get it? State the circumstances of the purchase.

Ans. Because I had so much difficulty with my wiring machine. From Knowlton & Beach. I simply bought it and paid for it.

Cross-int. 51. Knowlton & Beach, or some agent of theirs, called it to your attention. Isn't that so?

(Objected to as immaterial.)

143 Ans. I bought the machine of Mr. Beach.

Cross-int. 52. How long had you known Mr. Beach before you bought the machine?

Ans. Perhaps a year.

Cross-int. 53. And during that year he urged you several times, didn't he, to try one of his machines?

(The question is objected to as improper, immaterial and irrelevant.)

Ans. It didn't reguire any urging.

Cross-int. 54. You found him pretty energetic about the introduction of the machine, didn't you?

(Same objection.)

Ans. I should say, no.

(Redirect examination by Mr. DANE:)

Int. 55. With your experience, Mr. Jencks, with the stapling machine, and with the Beach corner-staying machines, what can you say as to their comparative value to the box-making trade; in other words, is the stapling machine better or not for the box-makers generally?

Ans. I don't think any one would ever buy a stapling machine now, if they could get one of the other machines. I should be glad to discard both of my wiring machines in favor of the Beach machine.

CHAS. W. JENCKS.

Deposition of Walter S. Barnes.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. Walter S. Barnes; 55; Somerville; paper-box manufacturer.

Int. 2. Where is your place of business, Mr. Barnes?

Ans. 301 Congress street, Boston.

Int. 3. About how long have you been engaged in the manufacture of boxes?

Ans. Since November, 1861.

Int. 4. State whether or not you stay or reinforce the corners of boxes and their covers by strips of paper or muslin, or both, at your factories, and if yea, how is it done.

Ans. Yes; and it is done mostly with a Knowlton & Beach staying machine, commonly known as the Beach machine.

144 Int. 5. Prior to the adoption of the Beach machine how was such work previously performed?

Ans. By hand labor.

Int. 6. What acquaintance, if any, have you with the various box manufacturers of the New England States and elsewhere?

Ans. I am personally acquainted with all the principal ones in the city of Boston, and considerable many in outside cities of Massachusetts and some few in the other New England States.

Int. 7. What do you know of the Paper Box Makers' Association of New England?

Ans. I am the second vice-president of the New England Paper Box Manufacturers' Association.

Int. 6. State whether or not, in your long continuance in the business of manufacturing paper boxes, you have known from time to time the various wants and requirements of the manufacturers in the production of their goods, and means for most effectively producing such work?

Ans. I should say that I had.

Int. 7. As between the staying of the corners of boxes by hand and that by the Beach machine, from your experience and knowledge, how do the two methods compare; which is the best?

Ans. The Beach machine is certainly the best; the comparison is five or six to one in favor of the Beach. I mean to say by that, that the Beach machine would accomplish from five to six times the work the same party would accomplish by hand.

Int. 8. What other advantages, if any, has the Beach machine in its operations upon the corners of boxes over that performed by hand? Whether it relates to uniformity in the application of the strip, durability, finished appearance, or otherwise?

Ans. It makes very much neater finish, and is very much firmer than the hand work.

Int. 9. Concerning the difference in time of drying, as between the hand work and that by the Beach machine, what can you say?

Ans. The work from the Beach machine can be used immediately; the hand work must be thoroughly dry.

Int. 10. Concerning the uniformity in the application and evenness with which the strips are usually applied to the corners, which is the most uniform of the two processes, hand work or that of the Beach machine?

Ans. The work of the Beach machine is perfectly uniform, and hand work can never be so.

145 Int. 11. What can you say as to the importance of the Beach machine to the box-making trade generally, as to its value and utility over all other methods known to you?

Ans. No box manufacturer can afford to do without it.

Int. 12. What, if any machine, as far as your knowledge extends, existed prior to the invention of Fred H. Beach for staying the corners of boxes, that was capable of feeding from a reel a ribbon of paper or muslin, toward a support adapted to sustain the corner of a box, upon which a portion of the ribbon was presented, severed from the ribbon, placed into position and firmly compressed to the corner of the box automatically?

Ans. I have no knowledge whatever of any machine such as described previous to the Beach machine.

Int. 13. Although a want for something capable of doing the work accomplished by the Beach machine was felt?

Ans. It was.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Cross-int. 14. What is the work accomplished by the Beach machine, and referred to in your last answer?

Ans. It stays the covers to boxes, and also puts pieces on the corners of boxes, what we call corner-pieces.

Cross-int. 15. How does it stay the corners of boxes or covers?

Ans. It is done with a strip of paper or muslin, which is moistened by paste; the strip after being moistened, passes through the machine and is stuck on the box.

Cross-int. 16. Over the box corner on the outside of the box?

Ans. Yes, sir.

Cross-int. 17. How long ago was the need of a machine that would paste a strip of paper or muslin on the box corner, so as to be wholly on the outside of the box, recognized?

Ans. I should say that never had been yet recognized in the particular form in which you put the question.

Cross-int. 18. Please consider your direct answers 12 and 13, and make such answers as you see fit?

Ans. If you read the answers carefully to 12 and 13, you will notice that the word "outside" is not contained in them at all.

Cross-int. 19. When the application of the patent in suit was filed, all its claims were limited to a mechanism, which would not only paste the strip on the outside of a box, but turn down a projecting end of the stay strip, and then push that projecting end inside

146 the box. You have testified that prior to the invention of Beach, a want was felt for something capable of doing the work accomplished by the Beach machine. And you have also testified that the Beach machine puts a stay strip on the box corner over the outside of the box. What I want to know is, which kind of a mechanism was desired prior to the invention of Beach; one that would simply put a stay strip on the outside of the box corner, or one that would put it not only on the outside of the box corner, but over the edge of the box, and inside the box?

(The question is objected to by counsel for complainant as improper in form, and as tending to mislead the witness, and for the further fact that the question in its material parts has been already answered, and that, if the question is based upon the answer to the 13th interrogatory, that question called for and was undoubtedly answered with a proper understanding by the witness, of what features were referred to, that the want of mechanical means to accomplish the work hitherto done by hand, whether it were inside or outside staying, or both. There was obviously a want.)

(Counsel for defendants calls the attention of the court to the fact that the patentee, in his specification as originally filed, states: "It is customary in making paper boxes to apply a strip over the corners which is pasted down on each side, and the overlaped end is turned under the under side. * * * My improvement consists of a machine to do the work." And counsel for defendants submits that it is material and relevant to inquire whether the demand for Beach's afterthought was recognized by the trade to his invention.)

Ans. I should say that it didn't make any difference which of those mechanisms it was, so long as the required strength was added by the material to the corner of the box.

(Adjourned to 3 o'clock p. m.

BOSTON, *Nov.* 23, 1893—3 o'clock p. m.

Met pursuant to adjournment.

Cross-int. 20. What I want to know is, if, prior to, we will say the middle of June, 1885, the trade recognized the need of any machine that would automatically secure stay strips on the outside of paper-box covers?

Ans. Certainly they did, as they recognized the need of any machine in any department of the business—the need of a machine that would be a labor-saving machine.

Cross-int. 21. And previous to 1885, as I understand you, it had been long customary to apply by hand a stay strip of paper or muslin on the outside of paper-box covers?

147 Ans. Yes.

Cross-int. 22. And by the outside I mean the outside only. Will your answer hold good to that sort of corner-staying?

Ans. Yes.

Direct examination resumed:

Int. 23. What acquaintance, if any, have you had with a machine for wiring the corners of boxes?

Ans. I had a wire staying machine in my factory for several years previous to March 10, 1893.

Int. 24. Why would not the wire machine serve in lieu of the Beach machine, about which you have been testifying?

Ans. Because it did not do such satisfactory work. Customers objected to the wire. Further than that, it was a machine that was constantly getting out of repair.

Int. 25. Aside from the dislike to the wiring by the customers, and the liability to get out of proper working order, did such — perform the work of staying that served as well as that done by hand or that done by the Beach machine?

Ans. It did not.

Int. 26. Since the introduction of the stapling machine, what can you say as to their increase or diminution among the trade, as to their use?

Ans. My belief is that there are none of them being sold today, and if any manufacturer is using them, he is simply doing so because he happens to have a machine on hand.

Cross-examination resumed:

Cross-int. 27. You say that is your belief. Do you know it to be a fact?

Ans. So far as my knowledge is concerned, yes.

Cross-int. 28. Does your knowledge embrace all the box manufacturers in the country?

Ans. Hardly.

WALTER S. BARNES.

Deposition of Charles A. Brackett.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. Charles A. Brackett; 62; West Newton, Mass.; paper-box manufacturer.

148 Int. 2. Where is your factory located?

Ans. 144 High street, Boston.

Int. 3. How long have you been engaged in the manufacture of boxes?

Ans. Since '67. I think it is.

Int. 4. State whether or not you know of an organization known as the Paper Box Makers' Association of New England?

Ans. I do.

Int. 5. State whether you have any connection with it, and if yea, in what capacity?

Ans. I am a member of the association.

Int. 6. What opportunities, if any, have you had to enable you to know more or less of the various ways and means by which paper boxes have been made and finished from time to time since you have been engaged in such manufacture?

Ans. Well, by improvements in machinery. Of course, when I first commenced to make boxes machinery was very different from what it is today.

Int. 7. How were the corners of boxes stayed or reinforced prior to the years 1885 and '6?

Ans. Stayed by hand. Girls take off a strip of cloth or paper and cut it off and turned the edges over, or either way, according to the boxes.

Int. 8. Now, how do you apply the stay strips of paper and muslin to the corners of the boxes made by you generally at this time?

Ans. By machine.

Int. 9. By what is known as the Beach corner-staying machine, or otherwise?

Ans. By the Beach machine.

Int. 10. What, if any, advantages have you found by your experience in the use of the Beach machine for staying the corners of boxes over similar work done by hand?

Ans. In the first place, they are more uniform in regard to work, and there is a great saving in the material and a great saving in the labor. A girl would stay up a thousand boxes probably in the old way, and from six to seven thousand in this way with the Beach machine.

Int. 11. How about the stability and durability of the work, as done by hand, and that done by the Beach machine? Which, from your experience, is the best?

149 Ans. I think the Beach machine work gives better satisfaction.

Int. 12. So far as your knowledge extends, what machine, if any, existed prior to the Beach invention for staying the corners of boxes, that was capable of automatically feeding and directing a strip to the corners of a box presented to be stayed or reinforced at its corners, and the strip severed, placed in position, and automatically fastened upon such corners?

Ans. The Beach machine was the first and only machine.

Cross-examination by EDWARD BEACH, Esq., of counsel for defendants:

Cross-int. 13. The preceding answer is wholly incorrect, is it not, if, for the word "strip" therein, we substitute the word "wire"?

Ans. I think the wire machine was in use before the muslin and paper machine.

Cross-int. 14. That doesn't quite answer the question. It seems to me that the answer to the question referred to in your direct examination would be wholly incorrect if the word "wire" were substituted for the word "strip" therein. Is that so, or not?

(The question objected to, as vague and as tending to mislead the witness; and is therefore improper.)

Ans. I don't understand what your question is.

Cross-int. 15. Prior to 1885, machines were well known for staying the corners of boxes that were capable of automatically feeding and directing a wire to the corner of a box presented to be stayed, or reinforces at its corners, the strip being severed and placed in position automatically to secure the box corner. That is correct, is it not?

Ans. Yes.

Cross-int. 16. With how many Beach machines have you b familiar?

Ans. I have two.

Cross-int. 17. How long have you had them?

Ans. The first one I bought July 25, 1889, I think; the sec one I bought early in '93.

Cross-int. 18. Does either one of your Beach machines contai mechanism for turning down the projecting end of a severed s strip, and then turning and pressing that down turned and wit the body of the box, so that the box corner is stayed, not only its outside, but also over the edge and on its inside at and adjac to the corner?

Ans. They do not.

150 Int. 19. Did you ever see a Beach machine that did cont such a mechanism?

Ans. I have not.

Cross-int. 20. What sort of a feed have your Beach machin describe them?

Ans. I couldn't tell you.

Cross-int. 21. Has either of them a slotted bed between two fe rolls, the under one of which is corrugated with ribs project through the slot of the feed-bed?

(The question is objected to as vague and indefinite.)

Ans. I couldn't tell.

Cross-int. 22. Can you tell whether there is an elastic bed betw the two feed-rolls, supposing there are two feed-rolls?

(Objected to as immaterial.)

Ans. I cannot.

Cross-int. 23. Are you a mechanic?

Ans. I am.

Cross-int. 24. You don't seem to know what the construct of your Beach machines is. Am I right in that supposition not?

Ans. I do not know.

Direct examination resumed.

Int. 25. What supports the ribbon of paper or muslin from wh the stay strips are severed upon the Beach machine?

Ans. I truly can't explain the mechanism of the machine beca I have nothing to do with them myself.

Int. 26. Can you tell whether the ribbon of paper or muslin supported upon a reel or within a box, or whether it lies loos upon the floor?

Ans. It is upon a reel.

Int. 27. Is the reel a part of the machine, or is it separate?

Ans. It is all connected to the machine.

Int. 28. What moves the strip of paper or muslin forward fr the reel towards the corner of the box?

Ans. I can't answer that.

Int. 29. Who has charge of the Beach machine—meaning charge of their running and use in the factory?

Ans. The foreman.

Int. 30. And the running and the care of the machines—is that left with the foreman in your factory?

Ans. We have an operator for each machine, and the foreman looks out for the repairs, and keeps them in running order.

151 Int. 31. Did you ever have in use at your factory a machine for wiring the corners of paper boxes?

Ans. I have.

Int. 32. Have you ever seen paper boxes that have been wired at their corners by a machine?

Ans. I have.

Int. 33. What can you say concerning their value, as compared with boxes whose corners are stayed by strips of paper or muslin by the Beach machines?

Ans. They are not good for anything only for very cheap work, and are not to be compared with work done by the Beach machine. They are not satisfactory to customers, and for covered work the wire breaks through.

Int. 34. What about the liability of the wire to break out at the corners of boxes, when used for uniting the corners of such?

Ans. Twenty-five per cent. of them will break out.

CHAS. A. BRACKETT.

(Adjourned until tomorrow at 10 o'clock a. m. Same place.)

BOSTON, MASS., *November 24th*, 1893—10 o'clock a. m.

Met pursuant to adjournment.

Present: Counsel as before.

Deposition of George H. Dickerman.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. George H. Dickerman; 69; winter residence, Somerville; manufacturer of paper boxes.

Int. 2. How long have you been engaged in the business of manufacturing boxes, and where?

Ans. Since January, 1855; Canton and Boston.

Int. 3. What means, if any, are employed by you at your factories for staying the corners of boxes either with strips of paper or muslin?

Ans. The Knowlton & Beach machine.

Int. 4. How long have you used the machine which you term the Knowlton & Beach machine?

Ans. The first machine purchased was early in November, 1888.

152 Int. 5. Prior to the purchase of the Beach machine what method was adopted by you at your factories for applying

stay strips of paper or muslin, or both, to the corners of paper boxes?

Ans. Hand work.

Int. 6. What, if any machine existed, so far as you know, prior to the Beach machine, that was capable of automatically feeding, applying, and fastening upon the corners of boxes strips of paper or muslin, as a reinforce or stay strip?

Ans. Not any.

Int. 7. As to the advantages, character of finish, perfection in workmanship, what can you say as to which of the two methods are the best; that is whether the hand process or the process by the Beach machine?

Ans. The strongest work is by hand; the best looking by the machine. For saving the machine is the one.

Int. 8. How about the labor-saving quantity produced?

Ans. We save fully 60 per cent. in labor and about 50 per cent. in stock.

Int. 9. Do you know anything concerning an organization known as the Box-Makers' Association of New England, and if yea, what connection, if any, have you with that organization?

Ans. Yea, I am president of the organization.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Cross-int. 10. What machines existed prior to the Beach machine that were capable of automatically feeding, applying, and fastening upon the corners of boxes reinforces or stay pieces of any kind you please?

Ans. I would like to ask if he means any machine for fastening corners, or whether he means fastened with muslin or paper?

Cross-int. 11. Any and all machines that stayed box corners.

Ans. There were machines about that time that stayed with metallic or wire pieces.

Cross-int. 12. Do you mean one and the same machine, or two different kinds of machines?

Ans. I mean another kind of machine.

Cross-int. 13. The wire machines were wire-stapling machines, weren't they?

Ans. Yes.

Cross-int. 14. And they automatically fed, applied, and fastened upon the corners of boxes, pieces of wire as a reinforce or stay piece, didn't they?

153 (The question is objected to as immaterial and irrelevant, and from the further fact that it does not appear by the evidence in this case or otherwise that the wire staples are in any sense a reinforce to the corners of boxes.)

Ans. They were for fastening.

Cross-int. 15. Fastening what?

Ans. The corners of boxes.

Cross-int. 16. And in those machines wire was fed between inter-

mittently acting feed-rolls, sections of it cut off, and bent upon a box corner, forced through the sides of the box and secured in place? Isn't that so?

(The question is objected to as immaterial and irrelevant, and for the further reason that the suggested factors of the question do not in anywise constitute the combination of any claim upon which the present suit is based.)

Ans. I think so.

Cross-int. 17. How many Beach machines have you?

Ans. Eight.

Cross-int. 18. Are they all identical in construction, one with the other?

(Objected to as immaterial.)

Ans. They make the same result.

Cross-int. 19. Some of them have been sold to you as improved machines, have they not, or machines having improvements?

(Same objection.)

Ans. I think so.

Cross-int. 20. I suppose all those Beach machines of yours contain mechanism for not only securing a stay strip to the outside of the box corner, but also for turning downwardly a projecting end of a severed stay piece, and means for turning in the down-turned projecting end, so that the box corner is stayed not only on its outside, but also over its edge, and on its inside. How is that?

(Objected to as immaterial.)

Ans. We use them only for staying on the outside.

Cross-int. 21. How are the machines constructed in this respect? Have they mechanisms for turning down and then inwardly projecting ends of the stay strip?

(Objected to as incompetent.)

Ans. I think they have not.

Cross-int. 22. Would it be desirable to use that auxiliary mechanism which I have referred to, even if it were in the machines?

Ans. Sometimes.

Cross-int. 23. But not generally?

154 Ans. Not generally.

Cross-int. 24. Now, why is that?

Ans. In the majority of work, the strength from outside application is satisfactory.

Cross-int. 25. It would require an unnecessary quantity of stock in most cases, would it not?

Ans. It would take some more stock.

Cross-int. 26. Now, are you familiar with the construction of the Beach machines that you have?

Ans. Not very.

Cross-int. 27. If you are able to describe the feeding mechanism in your Beach machines, I would like to have you do so.

Ans. I couldn't do it.

Cross-int. 28. Can you describe the severing mechanism?

(Objected to, as the question has been already substantially answered, and also as immaterial.)

Ans. I cannot.

Cross-int. 29. What were the nature of the improvements that were put out in the improved Beach machines that you have?

(Objected to, as the witness has already testified that he does not feel competent to explain the details of the Beach machine.)

(Counsel for defendant is not inquiring in this question about the details, but about the nature of the improvements.)

Ans. I would not attempt to describe it.

GEO. H. DICKERMAN.

Deposition of Herbert B. Chaffee.

Direct examination by JOHN DANE, Esq., Jr., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?

Ans. Herbert B. Chaffee; 35; Swampscott, now; superintendent.

Int. 2. Superintendent of what?

Ans. George H. Dickerman & Company's paper-box manufactory.

Int. 3. Where are the factories located?

Ans. 32 Green street, Boston.

Int. 4. How long have you been connected with Dickerman & Co., and how long in the paper-box business generally?

155 Ans. Approximately eight years to the first question; approximately 11 or 12 years to the last. I couldn't say exactly.

Int. 5. As superintendent of Dickerman & Co.'s box factory what are your principal duties there?

Ans. I do the manufacturing.

Int. 6. What machines, if any, are used at your factories for the staying of the corners of paper boxes?

Ans. The Knowlton & Beach machine, Hobbs wire-staying machine.

Int. 7. What, if any, machine existed, if you know, prior to the production of the Beach corner-staying machine, that was capable of automatically feeding from a strip or ribbon of paper or muslin, that severed and applied the strip to the corners of paper boxes, as a strengthening or reinforce strip?

Ans. I didn't know of any.

Int. 8. Prior to the adoption of the Beach corner-staying machines at your factories, how had the corner stay strips of muslin or paper been applied and secured to the corners of paper boxes?

Ans. They were all put on by hand.

Int. 9. What was the object in putting in the Beach corner-staying machines into your factories?

Ans. To cheapen the cost of production.

Int. 10. Was that object accomplished by the introduction and use of the Beach staying machines?

Ans. Yes, sir, most assuredly.

Int. 11. Besides lessening the cost of production of paper boxes, what other advantages, if any, have you found by the use of the Beach machine over that of hand work for a like purpose?

Ans. One great saving is in room; the space occupied by four machines would occupy about the same space that four hand girls would occupy; and one Beach machine will do about three, to put it low, ordinary hand workers.

Int. 12. How about the perfection of finish, as between the work done by hand and machine?

Ans. It is very much nicer looking.

Int. 13. How about uniformity in the application of the strip to the corners of the box, and regularity, as between the hand work, and the work accomplished by the Beach machine?

Ans. The machine work is very much more regular and uniform than the hand work.

156 Int. 14. How many of the Hobbs' stapling machines have you in use at your factory?

Ans. I think we have two machines left, but at the present time none of them are in use. Customers object very strongly to the use of the wire staple.

Int. 15. Have you had more than two at your factory at any time?

Ans. Yes, we have had four.

Int. 16. Why did you dispose of them?

Ans. They have gone out of date.

Int. 17. Why so?

Ans. There is something better in the market.

Int. 18. What is the better thing in the market?

Ans. The Beach machine, in my estimation.

Int. 19. Then the introduction of the Beach machine into your factories and the favorable results were such as to cause you to set aside and dispose of the stapling machine?

Ans. Yes, sir.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Int. 20. Please describe the feeding mechanism of your Beach machine.

Ans. Not being a machinist, I couldn't describe it accurately. I have a machinist that attends to the machines and fixes them.

Cross-int. 21. Describe it as best you can.

(Objected to as incompetent and immaterial.)

Ans. I don't think I could answer that question intelligently, so you would know any better about it when I got through.

Cross int. 22. Have you ever examined the feed mechanism?

Ans. I have looked it over. The most I look to in a machine is the result.

Cross-int. 23. What is the difference between the new machines that you have and the first Beach machine which you had?

Ans. No substantial difference, only one is perhaps a better looking machine than the other; perhaps more mechanical in construction.

Cross-int. 24. More mechanical in construction is what I understand to be substantial, and what I am trying to find out is, whether the advantages of the Beach machines that you are familiar with, are due to the combination of mechanisms substantially such as is described in his patent. And I will again ask you to de-
157 scribe the feed mechanism of your Beach machine, to the best of your ability.

(The question is objected to as highly improper, and as asking the witness to explain matters which he has already stated that he feels incompetent to do; furthermore the definition suggested by respondent's counsel is hardly pertinent, proper or competent, and furthermore is not proper cross-examination.)

Ans. I shall have to answer as I did before: it is something I would not attempt to do.

Cross-int. 25. Are your Beach machines adapted to stay the inside as well as the outside of box corners?

Ans. No, only the outside.

Cross-int. 26. What would be the practical value of a machine which is limited, by reason of its construction, to staying the outside, and then bending the projecting stay strip over and within the box, so as to stay the box corner both outside and inside?

Ans. Well, I think that I should rather have, for all of my machines, just the outside stay, for the reason that it takes less staying material.

Cross-int. 27. Suppose that Knowlton & Beach should offer you two box-corner staying machines at the same price, and of identically the same quality of workmanship, and that one of them should be adapted for outside staying and that only, and the other machine should be limited, in its operation, to the outside and inside staying referred to;—you would, as I understand you, unhesitatingly take the first-mentioned machine in preference to the second one referred to?

Ans. I would answer the question in this way: If I were to buy eight machines today, I should probably buy six of them for just staying the outside, and the other two for staying the inside.

Cross-int. 28. Speaking now, from your own personal experience and observation in the trade, is it your opinion that the trade in general would be of your opinion respecting this matter?

(The question is objected to as incompetent and improper.)

Ans. I don't think the trade in general would know anything about it, to tell you frankly. They couldn't tell the difference.

Cross-int. 29. Why not? Explain fully. I mean by the trade those engaged in the manufacture of paper boxes.

Ans. I wouldn't venture anybody else's opinion.

Cross-int. 30. I don't want you to venture any one else's opinion. I asked you for your own, and request that interrogatory 28 be re-read.

158 (The question is again objected to upon the grounds stated to the 28th cross-interrogatory, and for the further reason as calling for the operation of the mind, rather than for facts; therefore inadmissible, for certainly the witness must be ignorant as to what the opinion of the trade in general would be.)

Ans. I shall have to answer as I did before.

Cross-int. 31. You certainly can state what your opinion is about it, and that's all that I want. Please answer the question categorically?

(Further objected to as frivolous.)

Ans. I will say this: I hardly think to the majority of the manufacturers; they would hardly ask you the question whether the machine turned the stay in or not.

Cross-int. 32. Now, why would you buy six outside staying machines to two outside and inside staying machines?

Ans. To the majority of my customers the outside stay would be all right. I might have a few customers that would prefer to have the stay turn in. By having both machines I could satisfy both kinds of customers.

Cross-int. 33. Mere outside staying is adequate in every respect, is it not, for the great majority of all paper boxes whose corners are stayed by strips of paper or muslin, that are produced in the country?

Ans. Yes, sir; in my opinion.

Direct examination resumed:

Int. 34. State whether the corner of a box that is stayed with a strip, that is secured to the outside, folded over and upon the inner side of the corner, is or is not stronger than the corner of a box of the same grade that is provided with a strip only upon the outside, not folded over the edge and within the corner.

Ans. I don't think there is any doubt but what a stay turned in is much the stronger of the two; it is only in a matter of cost of extra staying paper that a manufacturer would look at.

Int. 35. What connection, if any, have you with the Paper Box Makers' Association of New England?

Ans. Secretary and treasurer.

Int. 36. I infer from your answer to the thirty-fourth interrogatory, that the manufacturer of paper boxes desires to save staying paper as much as possible, and this is one of the reasons why all boxes are not double-stayed by the application of a strip of paper or muslin folded upon the outer and inner corners of the boxes being stayed. Is such the fact or not?

159 Ans. With us it certainly would be; on a production of fifty thousand a day it makes quite a difference.

H. B. CHAFFEE.

Adjourned to 2 o'clock p. m.

Deposition of William Barbour.

BOSTON, *November* 24, 1893—2 o'clock p. m.

Met pursuant to adjournment.
Present: Counsel as before.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence and occupation?
Ans. William Barbour; 40; Everett, Mass.; paper-box manufacturer.
Int. 2. Where is your factory located?
Ans. 205 Congress street, Boston.
Int. 3. What class of boxes do you manufacture?
Ans. All classes.
Int. 4. Of paper?
Ans. Yes.
Int. 5. Do you stay or reinforce the corners of your paper boxes produced at your factory with strips of paper or muslin, or both; and if yea, by what means?
Ans. I do; by the Beach corner-staying machine.
Int. 6. How many such machines have you at your factory?
Ans. Two.
Int. 7. When first did you put such a machine into your factory?
Ans. It was in the fall of 1888 or 1889.
Int. 8. What means was employed by you for attaching stay strips of cloth or muslin over the corners of paper boxes prior to procuring and operating the Beach corner-staying machine?
Ans. I used the Hobbs wire staying machine partly, and partly hand work.
Int. 9. Did the Hobbs wire staying machine apply and attach strips of cloth or muslin over the corners of boxes?
Ans. It did not.
Int. 10. Which machine did you first use at your factory, the Hobbs wiring machine, or the Beach corner-staying machine?
Ans. The Hobbs wiring machine.
160 Int. 11. Why did you put into your factory the Beach corner-staying machine, if you had the Hobbs wiring machine in your factory prior?
Ans. Because the Hobbs wiring machine didn't give good satisfaction.
Int. 12. Have you the Hobbs wiring machine in your factory at the present time?
Ans. I have not.
Int. 13. What became of them?

Ans. I sold it.

Int. 14. Why did you sell it?

Ans. Why, I put in the Beach machine, and after using that awhile I found I had no further use of it, and I bought a second Beach machine and put it in. My business had increased, and I needed another machine.

Int. 15. What price did you pay for the wiring machine?

Ans. Two hundred and seventy-five dollars.

Int. 16. For what price did you sell it?

Ans. One hundred dollars.

Int. 17. In your answer to the fourteenth interrogatory you have stated in substance that after putting in the Beach machine and using it awhile, you had no further use for the Hobbs wiring machine. Why is this?

Ans. Well, the Hobbs wiring machine didn't give satisfaction, and I found that the Beach machine did, and eventually I threw out the wiring machine altogether, and sold it for the best price I could get for it.

Int. 18. What can you say concerning the value and importance of the work done by the Beach corner-staying machine over like work done by hand?

Ans. Well, it not only does the work in a superior manner, but is very much faster.

Int. 19. From your knowledge of the manufacture of paper boxes generally, both by hand and by the use of the Beach corner-staying machine, could a factory, in your opinion, doing work by hand, successfully compete with another using the Beach corner-staying machine?

Ans. It could not.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Cross-int. 20. Does either one of your Beach machines con-
161 tain mechanism for turning down the projecting ends of the stay strip and turning that downwardly turned end within the box, so as to stay the corner, not only on the outside, but also over the edge and on its inside?

Ans. They do not.

Cross-int. 21. Please describe the feed mechanism in your Beach machines?

Ans. Well, the paper or cloth is put on to a reel, at the back of the machine, and it is then fed through a guide over a V-shaped wheel (that is, the outer rim of the wheel is V-shaped), with one fitting it from the top to shape the paper at right angles to correspond with the corners of the box; this first wheel mentioned—the lower part runs in water or paste; the paper is next carried to a feeding apparatus, which carries it through a pair of cutters directly over the anvil on which the corner of the box is placed. When the machine is operated, the cutters cut the paper off the proper length to correspond with the depth of the box, and press it on to the corner of the box.

Cross-int. 22. Then the stay strip is trough-shaped when it passes between the roll that runs in the glue pot and the pressure roll above it?

Ans. It doesn't run in the glue pot.

Cross-int. 23. You mean that it runs in a paste or water?

Ans. Yes, sir.

Cross-int. 24. What is the shape of the guide that it runs through before it comes to the V wheels?

Ans. Well, it is a piece of brass with the back end turned up so that the paper will run over it easily, and a slot made through it the width of the paper.

Cross-int. 25. Is that slot a straight slot, or is it a sort of a V-shaped slot? In other words, does it change the paper in cross-section, when the paper passes through the slot?

Ans. The slot is a straight slot, and does not change the shape of the paper.

Cross-int. 26. Consider the two rolls between which the stay strip first passes after it leaves the guide; I judge that one of those rolls must be a pressure roll, and probably the upper one. Please explain what the fact is.

Ans. The upper roll is a pressure roll. The pressure is applied by means of a coiled spring.

162 Cross int. 27. Now, please describe the feeding mechanism that follows after the pair of rolls you have just described?

Ans. The feeding mechanism is a carriage which slides on a bed and the paper rests on a V-shaped base; directly over this is a pawl, which clinches the paper as the carriage moves forward, thus carrying the paper over the corner of the box. This carriage is operated by a series of levers.

Cross-int. 28. Next comes some sort of a severing mechanism, does it not?

Ans. Yes, sir.

Cross-int. 29. Please to describe that?

(Objected to as immaterial, for it matters not concerning the particular construction of the severing mechanism, for the reason that any suitable mechanism for cutting the strips at the proper time, in connection with the other factors of the combination, is allowable without regard to any particular formation or arrangement.)

Ans. The paper first passes through a hole in a piece of steel; on the front of this, connected with the plunger of the machine, is a round piece of steel with a V shape taken out of one side, to correspond with the corner of the box; the end of this round piece of steel presses against the face of the first-mentioned steel, and when the machine is operated, they pass by each other, thus severing the paper.

Cross-int. 30. It seems to be certain from what you have said that the path, or direction, in which the stay strip is fed, is in direct line with, and coincident with the apex of the work-support. Is that correct?

Ans. Yes.

Cross-int. 31. Is the plunger that comes down to press the stay strip on the box corner, laterally movable on your Beach machines automatically or otherwise?

Ans. I don't think it is laterally. I think it is rotary.

Cross-int. 32. And that is in order, is it not, that the angle formed by the two sides of the operating face of the plunger can be located directly over the apex of the anvil, to accommodate irregularities in the thickness of the stock adjacent to the corner proper.

(Objected to as vague, misty, and indefinite.)

Ans. I can't understand the exact meaning of the question.

Cross-int. 33. What is the purpose of having the plunger adjustable or rotary, as you suggest?

163 Ans. So that the pressure will be even on both sides of the paper.

Cross-int. 34. And this machine that you have been describing you understand to be the Beach machine described in the patent in suit?

(Objected to as incompetent, immaterial and as not proper cross-examination.)

(Counsel for defendant replies that, in view of the testimony taken this week to show what is alleged to be the extraordinary utility of "the Beach machine," it is relevant and material and admissible to show that the Beach machines about which these utility witnesses have been testifying are not substantially the machines described and claimed in the patent in suit, especially when that patent is construed by the file-wrapper and contents; and counsel for defendants respectfully submits to the court that it has now become plain that the usefulness of the much-vaunted Beach machines is due to some other invention than that set forth in the Beach patent in suit, and is probably due to inventions set forth in the defendants' Horton patent of later date, the feed mechanism and cutting mechanism of which would seem to have been considerably imitated by the constructors of the so-called Beach machines.)

Ans. I don't know what the patent in suit is.

Int. 35. I would like to know if that piece of steel through which there is a hole—the piece of steel referred to in your cross-answer 29—does not serve as a guide?

(Objected to as immaterial.)

Ans. The piece of steel referred to in cross-answer 29 rests on a bed, through which there is a hole for the paper to pass through, and the hole in the cutter does not necessarily act as a guide.

Redirect examination by Mr. DANE:

Int. 36. Does the Beach corner-staying machine at your factory contain more than one feeding apparatus for moving or advancing the ribbon strip of paper or muslin from the reel forward between

the shears or severing apparatus and the anvil upon which the c
ner of the box is rested while being operated upon?

Ans. As I understand that question, it is whether the mach
at our factory has more than one feeding apparatus to forward
paper in a process of putting it on the box. If that is correct, I
answer that it has but one.

Int. 37. What are the surfaces of the anvil and the counterp
that operates directly upon the corner of the box in the Beach
chine at your factory?

Ans. The anvil is shaped at right angles to conform to
164 inside of a square box. The counterpart is shaped to c
form to the outside of a square box, so that they will ma
together to compress the paper strips on the box.

Int. 38. Do you know a man by the name of James A. Horto
and if yea, did you ever have any business relations with him?

Ans. I do; I have.

Int. 39. Do you know whether said Horton ever examined eit
of the Beach corner-staying machines, now owned by you, an
yea, when first and what, if anything, do you know about it?

Ans. He has. The first machine that I purchased of Beach
sent to Mr. Horton's factory at Reading, Mass., to have one of
Horton's patent clutches attached to it, and I have no doubt
Horton examined the machine there, as he had immediate sup
vision over the machinery department, and, I understand, did
the drafting for such work. After the machine was returned to
factory he came in several times and went on the floor where t
machine was working, for the express purpose of examining
mechanism of said machine. I understood at the time that he
making these examinations for the purpose of informing himself
the exact construction of this machine, as he was about to constr
a machine for doing the same work.

Int. 40. And the result of the visitations and examinations of
Beach staying machine—the machine was constructed that is sho
and described in Defendants' Exhibit "Defendants' Patent," an
hibit in this case now before you?

(Objected to not only as leading, but because the witness cann
by any possibility answer the question of his own knowledge.)

Ans. Well, some time after these visits Mr. Horton invited me
to his factory to see his machine, and when I went there he sho
me a machine that he had constructed substantially the same
this exhibit referred to.

(Adjourned to Saturday, November 25, 1893, at ten o'clock a.

WILLIAM BARBOUR

165 BOSTON, MASS., *November* 25, 1893—10 o'clock a. m.

Met pursuant to adjournment.

Present: Counsel as before.

Deposition of Mark D. Knowlton.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. What is your name, age, residence, and occupation?

Ans. Mark D. Knowlton; 53; Rochester, N. Y.; manufacturer of paper-box machines.

Int. 2. State whether or not you are acquainted with Fred H. Beach, the complainant in this suit.

Ans. I am.

Int. 3. What connection, if any, have you with said Beach?

Ans. He is a partner in manufacturing machines, under the firm name of Knowlton & Beach.

Int. 4. Where are your factories located for manufacturing such machinery?

Ans. 13 and 15 Allen street, Rochester, N. Y.

Int. 5. When first, and under what circumstances did you become acquainted with Mr. Beach?

Ans. The first I heard of Mr. Beach was in 1888, when I applied for a patent on a paper-box corner-staying machine. I think it was from the Patent Office that I learned his name and residence, though I am not quite certain about that. I do know that my application for a patent was put in interference with one that he already had in the Patent Office.

Int. 6. State the result of the interference referred to between your application and that of Mr. Beach for the corner-staying machine.

(Objected to as irrelevant to any issue involved in this case, and therefore immaterial and inadmissible.)

Ans. The interference was declared in Mr. Beach's favor, on the preliminary statement; that is, the broad claims of the patent.

Int. 7. Do you know one James A. Horton, formerly of Reading, Mass.?

Ans. Yes, sir.

Int. 8. State whether or not the James A. Horton, the patentee of letters patent of the United States, No. 442,582, of December 9th, 1890, is the same Horton referred to in your last answer.

Ans. He is.

166 Int. 9. What, if anything, do you know concerning his application for the patent referred to in the last question and answer, particularly concerning the actions of the officials of the United States Patent Office, bearing upon his application for the patent in question, and particularly with reference to any rejection made by such officials?

(Objected to, because the question does not call for the best evidence obtainable upon this point.)

Ans. When Mr. Horton's patent, referred to above, was rep
as issued, I ordered the file-wrapper—the original abstract o
patent, and in looking it over I found that the ten claims tha
had claimed on his patent were all, or nearly all, rejected b
ferring to my English patent, issued in 1888 (I don't remembe
number).

(The answer objected to as not the best evidence, and as imm
rial, irrelevant, and inadmissible.)

Int. 10. Tell the court in what respect the staying machine
ented by you in England differed from the machine for stayin
corners of boxes, the application upon which the interference
declared between the latter and that of Mr. Fred H. Beach
complainant herein, which you say was decided in favor of
Beach.

Ans. Identically the same.

Int. 11. What familiarity, if any, have you had with the m
facture of paper boxes?

Ans. I have been a manufacturer of paper boxes for n
thirty years. I know about all there is in the business of m
facturing.

Int. 12. What machine, or machines, existed prior to the in
tion by the complainant, Fred H. Beach, that were capable of
matically feeding and applying a gum strip of paper or muslin
securing the said gum strip securely upon the corners of p
boxes?

Ans. There was none.

Int. 13. And prior to the said invention of Beach, how was
work usually performed?

Ans. In our factory only by hand.

Int. 14. How does the hand work compare with the work
formed by the Beach machine?

Ans. It was inferior; the corners of the covers had
167 moistened, and they warped badly. The hand work is m
inferior to machine work.

Int. 15. What other advantages, if any, has the Beach sta
machine in staying the corners of boxes by such strips of p
or muslin over like work done by hand?

Ans. The corner stay put on by the machine of paper or m
is put on practically dry, so that there is no warp or changi
the shape of the corner of the box or cover. This enables
workmen to put on a paper where the boxes are covered in a r
way, making the boxes perfectly square and the covers fit, ma
the boxes look neat and perfect. The hand stays would warp
get out of shape and would have to be formed up before cove
and even after covering. In order to make fine work the co
again had to be pressed up into shape when the covers had
stayed by hand.

Int. 16. How much more rapidly is the work produced by
Beach staying machine over that done by hand?

(Objected to until it is shown that the Beach staying machine contains merely the mechanisms patented by letters patent in suit, and does not depend for its practical utility upon other and different inventions.)

Ans. On a fair and good quality of work an operator would put on from four to six hundred pieces, or rather would make four to six hundred covers in a day; on the Beach machine that turned in the stay by the Beach patent, an operator could put from four to five thousand in the same time on the cheapest class of work that is done in factories, where the stay is not turned in to the inside of the box, the girls would do from one to 125 an hour; and the machine, putting on the same kind of a stay, would do about 600 an hour.

Int. 17. How about the strength of the corner of the box stayed by hand as compared with the same kind stayed by the Beach machine?

Ans. The machine work is a great deal stronger than hand work, excepting in cases where they want a very strong cover; then, using the same material, the strength would be about the same, but the way the machine would put on the corner, making the stay stick solid and close to the corner, would naturally be a great deal stronger than the hand work.

Int. 18. What can you say concerning the pressure applied by the use of the Beach machine, and the pressure applied to a like strip by the fingers? Which of the two methods is likely
168 to most firmly unite strips with the corners to which they are to be connected?

Ans. The machine work. All the pressure that the hand work has is what the fingers give it, and the machine can give it any desired pressure that is wanted.

Int. 19. And it is the pressure that causes the contracting surfaces to unite and intersect the fibres more or less, in accordance with the amount of pressure applied, or is it otherwise?

Ans. The pressure of the machine is the best to unite the stay.

Int. 20. Why do the corners of the boxes become warped as you have stated, when the operation of staying the corners is done by hand?

Ans. On account of the material that is used; it has to be soaked with the gum or paste, so that it becomes very pliable, and when put onto the box corner it remains where the fingers put it.

Int. 21. Why do not the same conditions apply when the Beach machine is used for a like purpose?

Ans. The stays are put on so rapid that the moisture from the gum or paste does not penetrate the stay strip but is absorbed by the material the box is made of, when the pressure is applied.

Int. 22. In the method of applying the stay strip by the use of the fingers, and that by the use of the Beach machine, which of the two consumed more paste or gum?

Ans. The hand process.

Int. 23. And is it because of the fact that a superfluous quantity

of paste, or gum is applied when the work is done by the use of the fingers?

Ans. It is.

Int. 24. In what material respect, if any, does the Beach machine, or the what is sometimes called the Knowlton & Beach machine, as made for the last three or four years, differ from the original machine as patented, so far as all the leading elements and combinations, that are set forth in the several claims of the Beach patent, and especially those that pertain to the staying of the exterior corners of boxes, as well as those that relate to the outer and inner stays combined?

Ans. There is no difference.

Int. 25. What, if anything, do you know concerning the use and value of the so-called wire-stapling machine, sometimes used for wiring the corners of boxes?

Ans. I know that such a machine was used quite extensively in 1888 and '89; it was accepted by many box-makers to help
169 them get out their work more promptly, but has been set aside, and the machines using paper and muslin strips have taken their place.

Int. 26. Were such stapling machines found to fill the requirements of the box-makers, so far as you know, and was the work done by such machines entirely satisfactory?

Ans. They were for some class of work, but the work was not satisfactory to the trade using boxes.

Cross-examination by EDWARD S. BEACH, Esq., of counsel for defendants:

Cross-int. 27. When did you first make the invention which you set forth in the application involved in the interference with Beach?

Ans. I think it was in 1886.

Cross-int. 28. Did you make a machine?

Ans. I did.

Cross-int. 29. Where was that machine made?

(Question objected to as immaterial.)

Ans. In Chicago, Illinois.

Cross-int. 30. Where and by whom?

Ans. E. P. Peacock, at 145 South Clinton street, Chicago.

Cross-int. 31. I suppose it was some months after your first conception before that machine was built?

Ans. Yes, sir.

Cross-int. 32. In what month was it begun?

Ans. In the spring of '87, I think.

Cross-int. 33. Was it '87 or '86?

Ans. '87.

Cross-int. 34. How did you come to make that invention?

Ans. We needed a machine, and I had thought for a good many years that it would be a good thing to have; tried the wire stay myself, and found it impracticable, and in working on other ma-

chinery that handled paper, I discovered that I could feed a stay strip. That started me in to build the machine.

Cross-int. 35. Did you make any sketches or drawings of your proposed machines as early as January, 1886?

Ans. I don't think I did.

Cross-int. 36. Along in February, was it?

Ans. No; it was in the spring of 1887.

Cross-int. 37. Was any testimony taken in the interference between you and Beach?

Ans. No, sir.

170 Cross-int. 38. You conceded priority of your invention to Beach in that interference, did you not?

Ans. I did, after consulting counsel, and there were several other interferences at the same time.

Cross-int. 39. Did you disclose your invention in any way, orally, by sketches, drawings, or by a model, we will say as early as March, 1886?

Ans. No, sir.

Cross-int. 40. April, 1886?

Ans. No, sir.

Cross-int. 41. How many machines did you build containing your invention, or have built for you?

(The question is objected to as presumptive, for the reason that the question assumes that a number of machines had been made, either by or for the witness, yet there is no evidence showing that machines were made.)

Ans. One; in 1887.

Cross-int. 42. How many thereafter?

Ans. About four hundred.

Cross-int. 43. What was done with those machines?

Ans. All but the first one have been sold to manufacturers of paper boxes.

Cross-int. 44. You had about 400 of your box-corner staying machines out at the time you conceded priority of your invention to Beach?

Ans. No, sir.

Cross-int. 45. How many?

Ans. Could not tell without referring to the books.

Cross-int. 46. In round numbers?

Ans. Less than fifteen, I think.

Cross-int. 47. Did the machine set forth in that application of yours, which was put into interference with Beach's, contain any mechanism for turning down the projecting ends of a stay strip, and for pushing that down-turned end within the box corner?

Ans. No, sir.

Cross-int. 48. You made the acquaintance of Mr. Beach before you conceded priority of invention, I suppose?

Ans. No, sir; I don't think I did. I don't remember whether we had an action on the patent at that time or not.

Cross-int. 49. How long after you conceded priority of invention to Beach did you enter into business relations with him?

Ans. I do not know whether it was before or after.

171 Cross-int. 50. It was about that time, was it?

Ans. It was about that time, yes, sir.

Cross-int. 51. And it was about that time the interference was declared, was it?

Ans. Yes, it was all in about 1888.

Cross-int. 52. I notice that the file-wrapper and contents of the original of the Beach patent in suit, No. 447,225, dated February 24, 1891, was filed by Mr. Osgood, of Rochester, N. Y., and that on the first of September, 1890, Mr. Osgood appointed Messrs. Dayton, Poole & Brown, of Chicago, as his associates in the case, with full power. You lived in Chicago at this time, didn't you?

Ans. Yes, sir.

Cross-int. 53. And you selected Messrs. Dayton, Poole & Brown as the attorneys to conduct the case after this time, did you not?

Ans. Yes, sir.

Cross-int. 54. How many different makes of box-corner staying machines, which automatically applied pieces of muslin or paper to the exterior only of box corners were known to you say November 1st, 1890?

Ans. Three, I think.

Cross-int. 55. And who were they?

Ans. The original Beach machine, the Knowlton & Beach machine and the Jaeger machine.

Direct examination resumed:

Int. 56. You refer to the Jaeger machine in your last answer; state whether or not the Jaeger referred to was in interference with Fred H. Beach before the Patent Office of the United States.

Ans. He was.

Int. 57. What was the result of that interference?

(Objected to as not calling for the best evidence.)

Ans. The decision was in favor of Fred H. Beach.

Int. 58. What other proceedings were had thereafter in which Jaegar was a party?

(Objected to as immaterial, irrelevant and inadmissible as to any issue involved in this suit; and further, because if by proceedings be meant proceedings in the court of record, the question does not call for the best evidence.)

Ans. There was a suit commenced in the northern district of the State of New York by Jaegar and Inman against Fred H. Beach,

172 and the Commissioner of Patents, I think, was to have the courts annul the Beach patent and declare the same in favor of Jaegar, and have the patent issued to him.

Int. 59. Was Jaegar successful in the suit referred to?

Ans. He was not.

Int. 60. In whose name did your English patent issue?

Ans. Mark D. Knowlton.

Int. 61. Who were your agents for procuring such patent?

Ans. William Brooks & Son, or Sons, I forget which.

Int. 62. Do you remember the number of the patent?

Ans. 5088, in 1888, I think was the number of the English patent.

Int. 63. Was the patent referred to in your last answer the only one issued to you in England, for machines for staying the corners of boxes?

Ans. It was.

Int. 64. Why did you concede priority of invention to Fred H. Beach?

Ans. Because I was told that he had already been in interference with Mr. Jaeger of New York and Mr. Marshall of Boston, and had defeated them on the same issue, and I thought I might as well concede it.

Int. 65. If the date of invention by you antedated that of Fred H. Beach, why did you concede priority to him?

Ans. My invention did not antedate Fred H. Beach.

Int. 66. Since entering into business relations with Mr. Beach, the complainant herein, what has been done in the way of manufacturing and supplying the trade with the Beach corner-staying machine; has the concern been continuously engaged in the business since the time of your first entering into business relations with Beach?

Ans. From the date of the agreement to July 1st, '90, I did not take an active part in selling machines. Mr. Beach devoted all his time, and since the date mentioned, both of us have devoted our time to manufacturing and selling.

Int. 67. Why was Dayton, Poole & Brown substituted in lieu of Mr. Osgood, who had been conducting the proceedings on the part of Mr. Beach before the Patent Office?

Ans. No particular reason, except that Dayton, Poole & Brown were located at Chicago, and were my solicitors, and we thought it best to have them handle the case after copartnership with Mr. Beach.

173 Int. 68. Was not Mr. Osgood considered as competent to conduct the proceedings on the part of Mr. Beach before the Patent Office as Dayton, Poole & Brown?

Ans. I think he was.

Int. 69. Why, then, was not the matter left with Mr. Osgood, instead of making a change?

Ans. It was a great deal more convenient for me to have Dayton, Poole & Brown handle the case; there being several of them, we thought they would handle it better. I was not acquainted with Mr. Osgood at all.

Int. 70. But why should your convenience be consulted rather than that of Mr. Beach, upon the proceedings in which he was the principal factor?

Ans. I don't know that there was any particular reason, further than I have stated.

Int. 71. Had you formed a partnership with Beach before this change of counsel?

Ans. Yes, sir.

Int. 72. How many of the interference proceedings against Beach had been instituted at the time or before the change of counsel was made?

Ans. Five.

Int. 73. Had all the several interferences been declared, and were proceedings had in all of the five cases in the taking of testimony or otherwise before the change of counsel?

Ans. Two were declared and decided on before; the other three about the same time of change of counsel.

Cross-examination resumed:

Cross-int. 74. Have all the parties with whom interferences were declared acquiesced in the validity of the Beach patent in suit, or have some or all of them defied it?

(Objected to as immaterial.)

Ans. Two have defied it, Jaegar and Inman.

Cross-int. 75. If you have brought any infringement suits against any parties other than the respondents in this suit, please to give the names of the parties to such suits, and state in what courts they are pending.

(Objected to as immaterial.)

Ans. We have two against manufacturers of the machines, one against Wilson Paper Box Machinery Company in the north-
174 ern district of the State of Illinois, and one against American Box Machine Co. and others in the northern district of New York.

Cross-int. 76. Are those all the suits you have brought under the patent herein in suit?

Ans. All against manufacturers of machines.

Cross-int. 77. That doesn't answer my question.

Ans. We have two suits against users, both in the southern district of New York.

Cross-int. 78. Who are the defendants in each of those two suits?

(Objected to as immaterial.)

Ans. One man's name is Winch, I think; I don't remember the other man's name.

Cross-int. 79. That makes five suits in all under the Beach reissue?

Ans. Yes, sir.

Redirect examination by Mr. DANE:

Int. 80. You have stated that interference proceedings as well as proceedings in the United States circuit court were had by Inman

and Jaeger, who were contesting for a patent for the invention claimed by Beach, and that such contests were decided in favor of Fred H. Beach, the complainant in this case. I now ask you to tell the court, if you can, what relation, if any, are the Jaeger and Inman to the Jaeger and Inman referred to in your answer to cross-interrogatory 74?

Ans. The same parties.

MARK D. KNOWLTON.

(Adjourned to call by either counsel.)

175 Circuit Court of the United States for the District of Massachusetts. In Equity.

FRED H. BEACH
v.
HOBBS MFG. CO. ET AL.

Stipulation.

It is stipulated by and between the respective parties hereto that defendants have to and including April 22d, 1894, within which to take further evidence, and that complainant have until and including the 21st day of May within which to take and close his evidence in reply, and that complainant shall forthwith and as soon as possible after the close and filing of defendants' record, cause to be printed under the direction of the clerk of this court, the records of plaintiff and defendant- with all reasonable dispatch.

It is also further stipulated, that counsel for either party to this cause may place the cause upon the calendar for the next term of court, for final hearing, and that counsel for the respective parties will be prepared for argument and a final disposition of the case before the close of the term.

Dated New York, April 16th, 1894.

JOHN DANE, JR.,
For Complainant.
EDWARD S. BEACH,
For Defendants.

Circuit Court of the United States, District of Massachusetts. In Equity.

FRED H. BEACH ET AL.
v.
HOBBS MANUFACTURING COMPANY ET AL.

SIR: Notice is hereby given that I shall proceed to take proofs for final hearing on the part of the defendants, under the 67th rule of the Supreme Court for courts in equity, as amended, or in accordance with the statutes in such case made and provided,
176 and in pursuance of the rules and practice of the court, before an examiner of this court, or other proper officer, under said statutes and rules, at the office of Charles P. Searle, Esq., num-

ber 535 Exchange building, Boston, Massachusetts, on Thursday, the nineteenth day of April, 1894, at ten o'clock in the forenoon, before said Charles P. Searle, Esq., notary public, and special examiner by consent of court.

You are invited to attend and cross-examine the witnesses produced. The examination will be adjourned from day to day, and to such time and place as may be required without further notice.

Boston, Mass., April 12th, 1894.

EDWARD S. BEACH,
Solicitor and Counsel for Defendants.

To John Dane, Jr., Esq., solicitor and counsel for complainant, 261 Broadway, New York.

Service on the above notice accepted this 14th day of April, 1894.

JOHN DANE, JR.,
Counsel for Complainant.

Circuit Court of the United States, District of Massachusetts. In Equity.

FRED H. BEACH
v.
HOBBS MANUFACTURING COMPANY ET AL.

BOSTON, *April* 19, 1894—10 o'clock a. m.

Met pursuant to notice.

Present: John Dane, Jr., Esq., for complainant; Edward S. Beach, Esq., for defendants.

Deposition of Clarence W. Hobbs.

Direct examination by EDWARD S. BEACH, of counsel for defendants:

Int. 1. What is your name, age, residence and occupation?

Ans. Clarence W. Hobbs; age, 41; residence, Worcester, Mass.; occupation, manufacturer of machinery for the manufacture of paper boxes.

Int. 2. Are you one of the defendants?

Ans. I am.

177 Int. 3. What connection have you with the Hobbs Manufacturing Company?

Ans. A partner and have sole charge of manufacturing.

Int. 4. What experience have you had in manufacturing paper-box machinery, and for what length of time?

Ans. I began the manufacture of paper-box machinery in 1883, and have been engaged in it most of the time since then and continuously since 1886.

Int. 5. Are you familiar, or not, with box-corner staying machines of the mechanical construction described and illustrated in the letters patent in suit to the complainant, F. H. Beach?

Ans. I am.

Int. 6. Are you familiar, or not, with box-corner staying machines of the mechanical construction of United States letters patent, No. 447,955, granted March 10, 1891, to Mark D. Knowlton of Chicago?

Ans. I am.

(Counsel for defendants now offers in evidence copy of said Knowlton patent, together with the certified copy of the file-wrapper and contents thereof, and the same are marked "Defendants' Exhibit Knowlton Patent and File-wrapper."

Int. 7. Whether, or not, said Knowlton is known to you as the partner of the complainant, Beach?

Ans. He is.

Int. 8. Whether, or not, the name of that firm is Knowlton & Beach?

Ans. It is.

Int. 9. Whether, or not, you are familiar with box-corner staying machines put upon the market by the firm of Knowlton & Beach?

Ans. I am.

Int. 10. State what you know, if anything, about the practical utility of box-corner staying machines of the mechanical construction set forth by the Beach letters patent in suit, giving your answer with special reference to the market demand therefor.

Ans. I know that in the year 1887 some machines were sold by Beach made in accordance with this patent, and that the purchasers, after they had attempted to use them for some time, abandoned them. The first machine I saw was at the factory of Macherlin & Manz in Rochester, N. Y. I had never seen a machine of Beach's make before and one of the firm undertook to show me how
178 the machine operated. He made several trials, but failed to make it work. He said it had never done satisfactory work, but that he expected Mr. Beach there the next week to fix it. The next machine I saw was at the factory of Hughes & Simpson in Troy, N. Y. It was not in use and the proprietor wished to sell it. I inquired why he did not use it, and he stated that he had never been able to make it work satisfactorily. I traded for it, giving him another machine, and allowed him $50 for the old one.

Int. 11. Was that Beach machine that you traded for an old or a new one? I mean to inquire with reference to its condition and length of time it had been used.

Ans. I understood that Mr. Simpson had had it about six months.

Int. 12. Whether or not the $50 that he accepted for it in the way of trade was approximately the cost to him of the machine. Have you any information on that point?

(Objected to as immaterial.)

Ans. I do not know what he paid for the machine. I had understood the price was $250.

Int. 13. What was the average price of machines of this character at that time?

(Objected to as immaterial and incompetent.)

Ans. The wire corner-staying machines upon the market, of which the price was $300, but I do not know the price Mr. Beach asked for his machines.

Int. 14. What, if any, striking differences of construction are there between machines of the construction described in the Beach patent in suit and machines of the construction described in the Knowlton patent 447,955?

Ans. One noticeable difference is the general plan and arrangement of the machines. In the Beach machine the reel of paper, the pasting apparatus, the feed and the cut-off are on the side of the machine, and the staying material is fed crosswise of the corner of the box; in the Knowlton machine these parts are in the rear portion of the machine, and the stay is fed endwise upon the corner of the box. In the Beach machine the feeding apparatus consists of a pair of rollers, which are given an intermittent motion. In the Knowlton machine the feed is a carrier and pail which slides inways. In the Beach machine the stay is fed forward flat and is bent over the corner of the box by the clamps. In the Knowlton machine the stay material is first drawn through a folder, which
179 creases it in the center. It then passes over the paste-wheel, which is V-shaped, and is carried forward in that shape until it is cut off and pressed upon the box. In the Beach machine the cut-off consisted of a shears, operated by a cam. In the Knowlton machine one blade of the cut-off is fixed in the frame of the machine, and the upper part of the clamping dies forms the movable part of the shear and the cut-off. The Beach machine is a cutting in apparatus for folding the stay on the inside of the box; the Knowlton machine had no cutting-in arrangement.

Int. 15. With machines of which construction, Knowlton or Beach have Knowlton & Beach supplied their customers?

Ans. With the Knowlton machine, so far as I am aware.

Int. 16. And what is the name of that machine?

Ans. It is now commonly called the Knowlton & Beach machine.

Int. 16. Have you read the depositions taken herein in behalf of the complainant of Ebenezer Spooner, J. Day Otis, Charles B. Baldwin, Charles W. Jenks, Walter S. Barnes, Charles A. Brackett, George H. Dickerman, Herbert B. Chaffee and William Barber?

Ans. I have.

Int. 17. If you are familiar with box-corner-staying machines in use by these parties, and referred to in their depositions, please to state, so far as you have personal knowledge, which machines they are using, Beach machines (of the construction set forth in the letters patent in suit) or Knowlton & Beach machines, of the construction set forth in the Exhibit Knowlton Patent.

(Objected to as incompetent.)

Ans. I have seen the machines in use in the factories of Mr.

Spooner, Mr. Otis, Mr. Jenks, Mr. Barnes, Mr. Brackett, Mr. Dickerman and Mr. Barber. These men all have the Knowlton & Beach machines.

Cross-examination by JOHN DANE, JR., Esq., of counsel for complainant:

Cross-int. 18. What do you consider to be the main or essential elements in the machine which you have termed the Beach machine for staying the corners of boxes?

Ans. The pasting apparatus, the feeder, cut-off, and the clamp for pressing the stay on the box.

Cross-int. 19. And the clamp consists of what?

Ans. It consists of a support and a movable part which may be brought to press upon the support.

180 Cross-int. 20. And the support, as you have termed it, is for what purpose and of what form?

Ans. The support is for holding the article which is to be clamped, and may be of any form to correspond with the shape of the article.

Cross-int. 21. What does the article refer to?

Ans. Whatever articles is to be clamped.

Cross-int. 22. Are the Beach machines referred to by you in your testimony used for varied purposes other than that for applying and staying the corners of boxes or covers thereto, or both?

Ans. I am not aware that they are used for other purposes.

Cross-int. 23. Does not the so-called Knowlton & Beach machine contain as essential elements a pasting apparatus, a feeding apparatus, a cutting apparatus, and means for supporting the corners of boxes or covers, and a movable counterpart acting vertically above the support, for compressing the stay strip upon the corners of boxes or covers?

Ans. They do.

Cross-int. 24. Do you know, of your own personal knowledge, who manufactured the so-called Beach machines and the Knowlton & Beach machines, about which you have testified?

Ans. I do not know.

Cross-int. 25. How many and at what time or times and places have you personally operated the Beach corner-staying machine and those which you have termed the Knowlton & Beach machines?

Ans. I have never personally operated the Beach machine, but saw the party attempting to operate it in the factory of Machelin & Manz in Rochester. I have at various times operated the Knowlton & Beach machine to the extent of staying a few covers, but could not now give the dates. It was in the latter part of 1886, or the early part of 1887 that I saw the machine in Rochester, but I cannot name the exact date. I have operated the Knowlton & Beach machine at my own factory on or about March 15th, of the present year.

Cross-int. 26. Who invited you in to see the machine at Rochester in 1887, which you have termed the Beach machine?

Ans. One of the firm of Machelin & Manz. I do not know whic member.

Cross-int. 27. What prompted you to go there at that time?

Ans. I was selling paper-box machinery, and called on them i the course of business.

181 Cross-int. 28. What machines were you engaged in sellin at that time?

Ans. I was dealing in all kinds of paper-box machinery.

Cross-int. 29. What kinds?

Ans. Scoring machines, shears, end-setting machines, and wi corner-staying machines, and some others.

Cross-int. 30. Who was the party, if you know, who was attemp ing to operate the Beach machine in the factory of Machelin Manz, of Rochester, as you have stated?

Ans. It was the member of the firm whom I met.

Cross-int. 31. Was it the person accustomed to run that machi at that factory?

Ans. I do not know.

Cross-int. 32. How much of an effort did this man make to oper the Beach machine?

Ans. He spent from 20 to 30 minutes.

Cross-int. 33. About 25 minutes?

Ans. In that neighborhood.

Cross-int. 34. And he failed entirely, did he, to stay the corne of a box or a cover?

Ans. He did not stay a corner of a box while I was there.

Cross-int. 35. What did the person say to you about the ma chine while you were there, and particularly during that 20 or 3 minutes?

Ans. After I had talked with him a while in the office about bo machinery, I showed him samples of work done on the wire ma chine. He asked me if I had ever seen a Beach machine. I tol him I had not. He invited me upstairs. I asked him how long h had used it. He said he had used it but very little. I asked hi why, and he said it would not do the work satisfactorily. He sai that he had worked on it a good deal without success, and that h expected Mr. Beach there shortly to fix it.

Cross-int. 36. Why did he undertake to operate it to show its wor to you, if it couldn't be used?

Ans. He said that sometimes it would work for a few moment but that he had never been able to get continuous work from it. suppose he undertook to show it to me to gratify my curiosity.

Cross-int. 37. Did he explain to you why it failed to operate in satisfactory manner?

Ans. He did not explain why the machine would not work

182 The result seemed to be that the stays were not put on th box properly.

Cross-int. 38. To whom did this seeming result referred to in you last answer appear?

Ans. To both of us. We discussed the matter briefly together

Cross-int. 39. Tell the court, if you please, wherein it failed t

apply and stay a strip upon the corner of a box or cover of either was operated upon at that time.

Ans. The stays were not applied to the box uniformly and as the man was trying to operate the machine, the stays would go on either crooked or would pull off, and he would often pull the stay out of the machine with his fingers.

Cross-int. 40. How many stays did he pull out with his fingers?

Ans. I did not count them.

Cross-int. 41. How many went on crooked?

Ans. I did not count them.

Cross-int. 42. Did he pull out more strips than what went on crooked?

Ans. I could not say.

Cross-int. 43. Which one of the firm took you up and attempted to operate the machine?

Ans. My impression is that it was Mr. Machelin, but I am not sure.

Cross-int. 44. But you are absolutely positive that it was either Mr. Machelin or Mr. Manz?

Ans. When I went into the office I presented my card to the man who came to meet me, and asked if he was a member of the firm, and he said he was.

Cross-int. 45. Then you didn't ascertain the name of the party. Is such the fact?

Ans. That is the fact.

Cross-int. 46. Was this your first visit at the place of business of Machelin & Manz?

Ans. It was.

Cross-int. 47. Did you effect any sale while there?

Ans. I did not.

Cross-int. 48. And you went away immediately after the Beach machine was shown you. Is such the fact or not?

Ans. I went away shortly afterward.

Cross-int. 49. What appeared to you to be the real difficulty, if any there was, with the so-called Beach machine at the time
183 you saw it, and what did the person who attempted to operate it say to you as to what appeared to be the real difficulty with the machine?

Ans. I made no examination of the machine to find out the reason why it would not work, and the man who showed it to me did not state any specific reason.

Cross-int. 50. Had you any acquaintance with Mr. Beach, the complainant in this case, at the time of your visit to Rochester?

Ans. I had met him once only.

Cross-int. 51. Had you any acquaintance with Mr. M. D. Knowlton at that time?

Ans. I had not.

Cross-int. 52. Did you know anything of their manufacture at that time, either Mr. Beach or Mr. Knowlton, or both, except the machine that you saw at Machelin & Manz?

Ans. I did not.

Cross-int. 53. When next after your visit at Rochester in 1886 or '87 did you see another machine for staying the corners of boxes with strips of paper or muslin, that was made by either Mr. Beach or M. D. Knowlton, or the firm of Knowlton & Beach?

Ans. The next machine I saw was at the factory of Hughes & Simpson, in Troy, N. Y., some months later.

Cross-int. 54. What date?

Ans. I cannot give the exact date.

Cross-int. 55. What year?

Ans. I think it was in the early part of 1888.

Cross-int. 56. But not positive?

Ans. I am not.

Cross-int. 57. Give the names of the parties that you know personally who attempted to use machines as you have stated made in accordance with the Beach patent, that abandoned them.

Ans. I know only what the box manufacturers whom I have named told me; Hughes & Simpson told me that they could not use the Beach machine, and had set it one side. F. Schoettle of Philadelphia told me about one year since that he had some of the original Beach machines, he did not say how many, but that they had been all replaced by other machines. The Morgan Envelope Company, of which Mr. Robert Day is the treasurer, told me about two years since that they purchased one of the original Beach machines, but were unable to make it work until they entirely rebuilt it.

(Complainant's counsel objects to all that part of the state-
184 ment of the witness after the first sentence as improper, incompetent and as hearsay, therefore inadmissible.)

(Adjourned until 2 o'clock.)

Cross-int. 58. Did Schoettle of Philadelphia tell you when he purchased the original Beach machine?

Ans. He did not.

Cross-int. 59. Did he tell you how many of the original Beach machines he had at any time?

Ans. He mentioned only one.

Cross-int. 60. Which one of the firm of Hughes & Simpson told you they could not use the Beach machine?

Ans. Mr. Hughes.

Cross-int. 61. On what date?

Ans. I can't give the exact date.

Cross-int. 62. What year?

Ans. Early in the year 1888.

Cross-int. 63. Spring?

Ans. I am unable to give the date.

Cross-int. 64. Can you not tell whether it was the spring or winter or summer of 1888?

Ans. It was in the early part of the year. I can't tell nearer than that.

Cross-int. 65. Was it spring or winter of 1888?

Ans. I cannot now tell whether it was in the spring or the winter.

Cross-int. 66. Were you at the factory of Hughes & Simpson at the time?

Ans. I was.

Cross-int. 67. What was said to you by Mr. Hughes, on the occasion referred to, respecting the Beach machine?

Ans. I had offered to sell him a wire-staying machine. He asked me what I would allow him for a Beach machine. I asked him if the machine was in working order, and he said he could not use it. I asked him what was the reason, and he replied that he could not make it work, and said that if I would allow him something for that he would take the wiring machine. I told him I would allow him on a trade for a wiring machine, the price of which was $300, $50 for his Beach machine, and the terms were accepted.

Cross-int. 68. Did you take the Beach machine?

Ans. I did.

185 Cross-int. 69. What did you do with it?

Ans. I sold it.

Cross-int. 70. For what purpose?

Ans. I do not know for what purpose it was used for.

Cross-int. 71. Did you sell it to a box manufacturer?

Ans. I did.

Cross-int. 72. Did Mr. Hughes tell you how long he had owned the Beach machine?

Ans. He did not.

Cross-int. 73. Did Mr. Robert Day, of the envelope company, tell you when they purchased the first Beach machine?

Ans. He did not.

Cross-int. 74. What month was it when you had this conversation with Mr. Day, referred to in your answer to cross-int. 67?

Ans. It was in April or May, 1892.

Cross-int. 75. At what place and who was present, if any one, besides yourself and Mr. Day?

Ans. It was at the office of the Morgan Envelope Company, in Springfield. No one else was present.

Cross-int. 76. Did not Mr. Day tell you on that occasion that some parts of the Beach machine were a little too light for their work?

Ans. He did not.

Cross-int. 77. And you will swear that he did not?

Ans. I will.

Cross-int. 78. Did you have any conversation with him about this Beach machine more than once?

Ans. Not to my recollection.

Cross-int. 79. Have you any doubts about it?

Ans. I have no recollection of any other conversation.

Cross-int. 80. Did Mr. Day explain to you what the rebuilding consisted of, referring to the Beach machine, about which you have testified?

Ans. He did not. He remarked that they put on some things of their own.

Cross-int. 81. Did he explain to you what those things were?

Ans. He did not.

Cross-int. 82. Did he tell you that the machine had not worked and served the purposes for which the machine was intended; that is to say, for the applying and staying automatically to the corners of boxes or covers stay strips of paper or muslin?

186 Ans. He said that as he received it he could not use it.

Cross-int. 83. And you will swear that Mr. Robert Day made the statement to you that as he received it he could not use it, in referring to the Beach machine about which you have already testified?

Ans. That was the substance of his statement.

Cross int. 84. But not the words?

Ans. Probably not the exact words.

Cross-int. 85. About what length of time were you engaged with Mr. Day in conversation at the time of this conversation about the Beach machine?

Ans. Possibly half an hour.

Cross-int. 86. And the entire half hour was devoted to discussing the Beach machine. Is such the fact?

Ans. It was not.

Cross-int. 87. What other matters were discussed?

Ans. We were talking about other box machinery a part of the time.

Cross-int. 88. About what proportion of the half hour was devoted to a discussion of the Beach machine?

Ans. O, a small portion of it, possibly five minutes.

Cross-int. 89. Did you ever have any other conversation with him concerning this Beach machine? If yea, when and who was present besides yourself and Mr. Day?

Ans. I do not remember any other conversation with Mr. Day about the Beach machine.

Cross-int. 90. Did Mr. Day show you what parts or attachments they had made to be applied to the Beach machine referred to?

Ans. He did not.

Cross-int. 91. Did he explain to you the nature of the parts or attachments which they applied?

Ans. He did not.

Cross-int. 92. And you did not examine or test the machine yourself?

Ans. I did not.

Cross-int. 93. When if ever did you first see a corner-staying machine made in accordance with complainant's patent upon which this suit is based, that would not serve the purpose for which the thing was intended, that was operated by yourself?

Ans. I never undertook to operate a Beach machine.

Cross-int. 94. Did you ever see a Beach machine made in
187 accordance with this patent upon which this suit is based, that would not operate for the purposes intended, that is to

say, to automatically present, apply, cut off and secure to the corner of a box or a cover thereto, except the one which you say some person attempted to operate at the factory of Machelin & Manz?

Ans. I did not.

Cross-int. 95. Did the person at the factory of Machelin & Manz state about how long they had had the Beach machine at the factory at the time you saw it?

Ans. He did not.

Cross-int. 95. To whom did you sell the Beach machine which you took in trade for the stapling machine?

Ans. G. A. Bisler of Philadelphia.

Cross-int. 96. When did you sell it to him?

Ans. Shortly after I purchased it.

Cross-int. 97. Had you examined the machine or seen it when you sold it to him?

Ans. I had not.

Cross-int. 98. When after the sale to him did you hear about it in any way?

Ans. I have heard nothing further from it.

Cross-int. 99. So far as the staying the corner of a box or a cover thereto by a machine automatically, it matters not, does it, whether the strip is fed across the corner in a direction at right angles thereto, or whether fed in a line with the corner in the direction of its length or depth of the box corner, and in either case, if the stay strip of paper or muslin was properly compressed upon the corner of the box, they would be the same, would they not, so far as the purposes of a stay or reinforce at or upon the corners, are concerned?

Ans. The result would be very much the same. When some kinds of staying material are used, it is thought by some to be better to feed the stay crosswise of the corner, because the grain of the stay material usually runs in the same direction as the length of the strip, and the stay is accordingly somewhat stronger. Otherwise than that, the result is the same.

(The statement of the witness is objected to as irresponsive to the question, and the question is, therefore, repeated.)

Ans. Practically the same.

Cross-int. 100. Is the Knowlton machine, referred to in
188 your answer to interrogatory 14, the machine usually known as the Knowlton & Beach corner staying machine?

Ans. Yes, sir.

Cross-int. 101. Explain, if you please, the form of the folder in the Knowlton & Beach corner-staying machine.

Ans. The stay first passes through a guide, which controls its sidewise motion. It is then drawn over a piece of metal set vertically, which presses upon the centre of the stay strip underneath, and thence through drives which fold the two edges down. It is then drawn through a vertical slot, which bring the two edges of the stay close together.

(The statement of the witness is objected to as irresponsive and the question repeated.)

The folding device proper consists of a piece of brass, the edges of which are moulded over in such a manner that as the stay is drawn through it the two edges of the stay are brought together.

Cross-int. 102. And this thing that you have described in your last answer is interposed or located at a point between what on the Knowlton & Beach machine?

Ans. Between the reel of stay and the paste-wheel.

Cross-int. 103. And it is an attachment, is it not, to the machine proper?

Ans. It is attached to the machine.

Cross-int. 104. And it does not in any sense modify the action of the reel or the roll of paper supported by the reel, does it?

Ans. I think not.

Cross-int. 105. And it does not modify the action of the pasting apparatus, does it?

Ans. It prepares the stay so that the pasting apparatus can operate upon it.

(Statement of the witness is objected to as irresponsive and the question is repeated.)

The pasting apparatus would not perform its functions if the stay was not so bent.

(Same objection. Question repeated.)

No.

Cross-int. 106. And it does not in anywise modify the action of the cutting or severing apparatus, does it?

Ans. Will you please explain what you mean by modify?

Cross-int. 107. Does the fact that the thing that you have called the folder is located between the reel and the pasting apparatus affect the cutting apparatus, which you say the Knowlton & Beach machine contains?

189

Ans. I do not know that it does.

Cross-int. 108. As a matter of fact, do you not know that the interposition of the "thing" that you have termed the folder does not in any sense, or in anywise, affect the cutting or severing apparatus which you say the Knowlton & Beach machine contains?

Ans. The cutting and severing apparatus of the Knowlton & Beach machine is of such form that the stay could not readily be fed through it if it were not previously folded. In that sense only does it affect the cutting apparatus.

(The statement is objected to as irresponsive, and the question repeated.)

It does not affect it directly.

Cross-int. 109. Does the fact that the "thing" that you termed the folder interpose between the reel and the pasting apparatus in anywise affect the supporting anvil upon which the corner of the box is rested while being operated upon?

Ans. I do not think it does.

Cross-int. 110. Does the "thing" that you have termed the folder

affect the operation of the plunger which serves to compress the strip upon the corner of the box or cover operated upon?

Ans. It does not, so far as I am aware.

Cross-int. 111. Please tell the court when you saw the several machines referred to in the seventeenth question, and how carefully you examined each one of the machines which you say you saw in use as stated in the answer referred to.

Ans. I cannot give the dates upon which I saw the machines in the different places. It was at different times, as I called upon these men in the course of business. I did not examine the machines particularly. I was familiar with the general appearance of the Knowlton & Beach machine, and so recognized them as I saw them.

Cross-int. 112. I want you to tell the court whether the machines of the Knowlton & Beach style which you say you saw at Mr. Spooner's factory were precisely the same as the machines which you saw in Mr. Jenks' factory.

Ans. I cannot say whether they were precisely the same style or not.

Cross-int. 113. How many times have you read the specification and claims of the patent to M. D. Knowlton, No. 447,955?

190 Ans. I have never read the specification and claims of the patents of M. D. Knowlton. I examined the drawings briefly.

Cross-int. 114. How many times have you ever read the specification and claims of the Beach upon which this suit is based, and in which you are now testifying?

Ans. I cannot say how many times.

Cross-int. 115. Do you mean to say you are perfectly familiar with the specification and claims, particularly the latter? I refer particularly to the Beach patent upon which this suit is based.

Ans. I am somewhat familiar with them.

(The statement of the witness is objected to as not an answer to the question, and it is therefore repeated.)

Ans. I am not perfectly familiar with them.

Cross-int. 116. How long have you been engaged in the manufacture of paper-box machinery? Beginning in what year?

Ans. Beginning in 1883.

Cross-int. 117. At what place?

Ans. Boston.

Cross-int. 118. How long did you continue in Boston?

Ans. Nine months.

Cross-int. 119. From Boston where did you go?

Ans. To Lynn.

Cross-int. 120. How long did you remain in Lynn?

Ans. Until 1887.

Cross-int. 121. From Lynn where did you go?

Ans. I continued to reside in Lynn and to do business in Boston until the summer of 1891.

Cross-int. 122. Then, if I understand you correctly, you were con-

tinuously and constantly engaged in the manufacture of paper-box machinery in the city of Boston from 1883 until 1891; is such the fact?

Ans. I said I was in Lynn some of that time, sir.

Cross-int. 123. How long were you engaged in the manufacture of box machinery in Lynn, all told?

Ans. From 1883, June, until 1887 I made some box machinery in connection with the manufacture of paper boxes in the city of Lynn.

Cross-int. 124. When did you cease to manufacture paper-box machinery in Lynn, and under what circumstances?

Ans. In 1887. The firm with which I was connected was dissolved on account of the death of one of the partners, and the
191 machinery and business which they owned was sold, and I removed my business to Boston immediately after.

Cross-int. 125. How long did you continue in Boston after the dissolution referred to in your last answer?

Ans. Until July, 1891.

Cross-int. 125. And from Boston to what place did you go?

Ans. To Worcester.

Cross-int. 126. When did you go to Worcester? What year?

Ans. 1891.

Cross-int. 127. Why did you leave Boston with your business?

Ans. Because of advantageous business connections which I made in Worcester.

Cross-int. 128. What was it that you removed to Boston that you have constituted "my business," after the firm was dissolved in 1887?

Ans. Some box machines which I had in stock for sale, books of account, some contracts for supplying paper boxes.

Cross-int. 129. What box machines did you remove, as stated in your last answer?

Ans. Some wire box-staying machines and end-setting machines. That's about all.

Cross-int. 130. Where, upon what street, was the factory of Machelin & Manz?

Ans. I do not know the name of the street.

Cross-int. 131. How many rooms did you visit at the place of business of Machelin & Manz at Rochester at the time of your visit there?

Ans. The office and the room where the machine was.

Cross-int. 132. Where was the office located, and where was the room, referred to, where the machine was?

Ans. I do not remember where the office was, I think it was up one flight. I think the room was on the same floor but I am not sure.

Cross-int. 133. What was the size of the room in which you found the machine at Machelin & Manz?

Ans. I did not measure it.

Cross-int. 134. About?

Ans. I do not know. It was an ordinary size working-room.

Cross-int. 135. Did you ever see a room 100 feet long that was a working-room?

Ans. I have.

192 Cross-int. 136. You have seen them about 12 and 14 feet long that were working-rooms, have you not?

Ans. I have.

Cross-int. 137. Did you see any other machines in the room where you saw the Beach machine at the so-called factory of Machelin & Manz?

Ans. I do not remember any.

Cross-int. 138. How many workmen or operators or persons if there were those, of different grades, did you see in the factory referred to in my last preceding question?

Ans. There were several people about. I do not know how many.

Cross int. 139. State approximately the number.

Ans. Three or four perhaps, I do not remember.

Cross-int. 140. What were these three or four persons doing while you were making your visit at the factory of Machelin & Manz?

Ans. They appeared to be busy. I do not know what they were doing.

Cross-int. 141. Did you have any conversation with any one of those two or three persons while there?

Ans. I did not.

Cross-int. 142. When giving the dates, did you visit at Dickerman's factory, and saw the corner-staying machines about which you have testified in your evidence today?

Ans. I have visited Mr. Dickerman's factory frequently during the past six years. I cannot say at what date I first saw the Beach machine.

Cross-int. 143. When last did you examine the machine of Knowlton & Beach's make at the factory of Mr. Dickerman, of Dickerman & Co.?

Ans. I saw the machine there but once. It was when he first put one in. I should think it was about four years ago.

Cross-int. 144. Who invited you in upon the occasion referred to in your last answer?

Ans. Mr. Dickerman.

Cross-int. 145. And Mr. Dickerman accompanied you into the workshop, or place where the machine was being operated, and you had some conversation with him upon this occasion about the machine, did you not?

193 Ans. Mr. Dickerman accompanied me, and we had some conversation.

Cross-int. 146. What was the conversation? What did Mr. Dickerman say to you, and what did you say to Mr. Dickerman on the occasion of your visit to the machine together?

Ans. I do not recall the full conversation. He had taken me into the factory to show me another machine, and as we were moving towards the stairway to leave the room, he called my attention to a machine that we passed and said that it was a new staying machine which had just come in. He explained that it was a ma-

chine for staying boxes with paper and paste. The machine was not running at the time.

Cross-int. 147. Have you stated all the conversation that you can recollect you had at the time of this visit at Dickerman's factory?

Ans. We talked about the machine a little. I asked him how he liked the looks of it, and he said the machine had only just come in, and he didn't know whether it would be a successful machine or not, but that if it worked well he should have use for it. We spoke only in a general way, and then passed on.

Cross-int. 148. Have you recited in your last answer all that you stated in your conversation?

Ans. All that I remember now.

Cross-int. 149. Then your best recollection and belief is that you have recited all the conversation had between Dickerman and yourself concerning the Beach or the Knowlton & Beach corner-staying machine?

Ans. All that I remember now.

(Adjourned to 9 30 a. m., April 20, 1894.)

BOSTON, *April* 20, 1894.

Met pursuant to adjournment.

Present: Counsel as before.

Int. 150. You have been asked what you considered to be the main elements of the Beach machine, and whether the Beach machines referred to by you are used for various purposes other than for staying box corners. You have stated that the pasting apparatus, the feeder, cut off and clamp are the main elements of the Beach machine. What other uses, if any, might the Beach machine containing these elements, and with or without a reel, be put to if desired?

(The question is objected to as irrelevant and immaterial.)

194 Ans. A machine containing the elements of a pasting apparatus, a feeding device, a cut-off and a clamp may be put to a variety of uses, when use might be the affixing of an address slip to a newspaper.

(The complainant's counsel objects to the answer of the witness as wholly immaterial and irrelevant.)

Int. 151. Can you state whether or not before the year 1885 said elements above referred to were combined substantially as in the Beach machine, with perhaps two differences, that the working faces of the dies or clamps were flat instead of angular, and the strip printed with addresses instead of being unprinted, for the purpose of affixing labels to newspapers and the like?

(Complainant's counsel objects to the question as grossly leading, improper, immaterial, and wholly irrelevant.)

Ans. A mailing machine was in use in the office of Daily Eastern Argus in Portland, Maine, between the years 1870 and 1880, for

affixing labels to newspaper wrappers, which contained a pasting apparatus, a feeding device, a cut-off and a clamp. The faces of the clamp were flat.

(Complainant's counsel also objects to the answer of the witness as incompetent and inadmissible as evidence.)

Int. 152. Was that mailing machine in use at that place before the year 1885, or was it not?

(The question objected to as grossly leading, improper, immaterial and irrelevant.)

Ans. It was.

Int. 153. What, if any, substantial difference was there between that mailing machine and the Beach machine, so far as the combination and mode of operation and result are concerned?

(Same objection.)

Ans. The combination of parts was in the same order in the mailing machine and the Beach machine. The pasters differed in form in that in the mailing machine the paster consisted of a rubber band, which was on one part of its travel immersed in the paste, and in the other half of its travel acted as a carrier, as well as to apply the paste. The rubber band was mounted on rolls, one at each end of the machine.

In the Beach machine the paste was applied to the strip directly by a roll running in paste. In the mailing machine the stay was fed forward by the finger of the operator, by causing the forward roll upon which the rubber band was mounted to revolve.

195 In the Beach machine the feeding was accomplished by a mechanism connected with the driving power. In the mailing machine the cut-off and clamp were also worked by hand. In the Beach machine both were worked by the driving power. The result in each machine is practically the same, a piece of the strip being pasted, fed forward, cut off and pressed upon the object between the clamps.

Int. 154. You have been asked whether the result obtained by the back-feed and side-feed box-corner staying machines was not substantially the same in both cases. Please now state whether there are any practical differences between back-feed and side-feed box-corner staying machines which render one class of machines more advantageous than the other class, and if so, state what the differences are.

(The question, as well as any answer that may be given thereto, is objected to, on the ground, first, that it is not a question in issue here which of the two methods of feeding the strip is the best, while there may be some slight difference in degree, such a degree in this instance is not material, neither is it relevant. Furthermore the witness has not shown himself to be competent to properly testify concerning the features inquired about in the question.)

(Counsel for defendants calls the attention of the court to the fact

that several parties called by the complainant have testified at length to the alleged utility of the Beach machine, that it is now plain from the record that they were talking about the Knowlton & Beach machine; that the Knowlton & Beach machine is constructed in substantial accordance with the Exhibit "Knowlton Patent," granted to the partner of this complainant; that the Beach machine is a side-feed machine, and that the Knowlton & Beach machine is a back-feed machine. And it is submitted that it is material and relevant to the issues in this suit, and to the equities thereof to ascertain whether there are any advantages possessed by one class of machine over the other class, and especially with reference to the question whether the testimony of the complainant's "utility witnesses" is competent to bolster up the alleged invention of the specific claims sued upon.)

(Complainant's counsel states that, notwithstanding the remarks of defendants' counsel as to the last previous question, that inasmuch as the inventions of M. D. Knowlton, which are tributary to the claims of complainant's patent in issue in this case it is wholly immaterial, for, as a matter of fact, that after interference proceedings had before the Patent Office the broad claims and all the fundamental and essential elements necessary to automatically feed, paste, sever and stay upon the corners of boxes or covers thereto, were awarded, granted and issued to the complainant, Fred S. Beach.)

Ans. In the Beach machine the pasting and feeding apparatus, being mounted at the side of the clamping dies and in close
196 proximity thereto, interfere with the rapid manipulation of the box, rendering it necessary to withdraw the box from the dies at each operation. In the back-feed machine the front of the machine is left clear for the manipulation of the box, and the corners can be successively presented to the die with great rapidity and with fewer motions on the part of the operator. In the side-feed machine a different width of staying material is required for boxes of varying depths. In the back-feed machines one width of staying material is used for all depths of boxes. These two features constitute the principal advantages which a back-feed machine has over a side-feed machine.

Int. 155. Whether or not any increased economy of manufacture of boxes is obtained by the back feed over the side feed, and if yea, to what extent?

(Question objected to as leading and incompetent.)

Ans. Whatever economy is effected by the back feed over the side feed would be due to the larger capacity of the back-feed machine, by which the operator could turn off a larger number of boxes per day, and the cost of doing the work would be accordingly less. I cannot say just what the difference would be, but should estimate it to be in the neighborhood of ten per cent.

Int. 156. You have been cross-examined at length with respect of the folding device of the machines put on the market by the complainant and his partner. Please state whether these machines

would be operative without that folding device and give your reasons for your answer.

(Question objected to as wholly incompetent.)

Ans. I do not think the Knowlton machine would be operative without the folding device, for the reason that the feeding apparatus is constructed to feed a stay bent in the form of an inverted V, and the fixed member of the cutting apparatus is so constructed that unless the stay be bent into this form, it could not pass through it freely. I think there would also be difficulty in effecting a distribution of paste upon the stay unless the stay had been so folded before it reaches the paste-wheel.

Int. 157. If an unbent or flat stay strip were carried over the wheel in the Knowlton & Beach machine on the market, to paste what extent would paste be distributed on the strip?

(The question is objected to, as well as any answer that may be given thereto as incompetent and theoretical.)

Ans. In the Knowlton & Beach machine upon the market
197 the working face of the paste-wheel is in the form of an inverted V: directly over the paste-wheel is a wheel or roller having a grooved face to fit the angle of the face of the paste-wheel. The office of this roller is to press the stay strip closely to the paste-wheel. If the stay material were of considerable stiffness, the degree of pressure necessary to bring the stay down on the paste-wheel so as to get a good distribution of the paste; if the stay had not been previously folded would cause so much resistance to the feeder as to seriously interfere with its operation if it did not altogether prevent it from feeding the stay following.

(Recross-examination by Mr. DANE:)

Cross int. 158. The formation of the pasting surface of the paste-wheel in the machine that you have denominated the Knowlton & Beach machine, is provided with a V-shaped surface for the purpose of conforming to the inner folded surface of the stay strip, as it passes from the "thing," as you have termed it, or the folder?

Ans. When the stay leaves the folder the two edges of the stay strip have been brought together, and the two sides of stay folded close. The shape of the paste-wheel causes this fold to open, to conform to its surface. The degree to which the folded stay opens is controlled in the machine by the shape of the paste-wheel and the rider. If it were not for the rider the elasticity of the staying material would cause the fold to open probably to about an equal degree.

Cross-int. 159. The word "yes" would have been a proper and correct answer to my last previous question, would it not?

Ans. I do not think the word "yes" would have answered the question.

Cross-int. 160. Why not?

Ans. Because when the stay leaves the folder the sides are folded

close together and it cannot be told whether the elasticity of the stay would cause it to open so as to fit the paste-wheel or not.

Cross-int. 161. Do you not know, as a matter of fact, that the paste-wheel, with its V-shaped surface, applies to the inner surface of the folded stay strip, the paste or moisture necessary in order to give it the necessary adhesive qualities before the same is applied to the corner of the box?

Ans. Yes, sir.

Cross-int. 162. And the surface of the paste-wheel would be flat instead of V-shaped, with the same strip of paper or muslin
198 passed over the pasting apparatus, if the strip was being run flat instead of being folded? Is not such the fact?

Ans. Yes.

Cross-int. 163. And if a strip of paper or muslin fed from a reel over a similar pasting apparatus, and with an interposed form between the reel and the pasting apparatus so as to curve the strip in more or less of a circular form, the paste-wheel would necessarily be provided with a pasting surface of a form corresponding substantially to the form of the curved strip which was being fed over or through the pasting apparatus? Is not such the fact?

Ans. I should say it was.

Cross-int. 164. Then the pasting or the application of the paste to the under surface of the strip would be substantially the same in each of the different forms about which you have testified, would they not?

Ans. The paste would be applied to the under surface of the stay; yes

Cross-int. 165. Is the word "yes" in the last answer, the answer to the previous question?

Ans. It is.

Cross-int. 166. When did you last operate a corner-staying machine constructed in accordance with the Beach patent, as you understand it, on which this suit is based?

Ans. I never operated a Beach machine, or a machine constructed in accordance with the Beach patent.

Cross-int. 167. Where is the labeling machine about which you have been testifying this morning?

Ans. I do not know.

Cross-int. 168. When did you operate it?

Ans. In 1871 and in 1872.

Cross-int. 169. It was the ordinary labeling machine employed in various other newspaper offices, I suppose? Is such the fact?

Ans. It was called the Dick mailing machine. I do not know how generally the machine was used.

Cross-int. 170. Do you mean to say that a jeweller's box of 2 inches and 2½ inches square requires the same width of strip in staying its corners as a shoe box and various other boxes used by the dry goods and other merchants from 10 to 18 inches in dimensions across, and six to 8 inches in depth?

Ans. I have not so stated.

Cross-int. 171. What is the fact, if you have not so stated, as regards the requirements in the staying of corners of boxes of the different sizes referred to in my last previous question?

199

Ans. A jewelry box would not require as wide or as heavy a stay as the larger box you have specified.

Cross-int. 172. And there would be no economy in using a strip of greater width than is actually required in such boxes. Is such the fact?

Ans. There would be no economy.

Cross-int. 173. Can you state of your own personal knowledge that a corner-staying machine, adapted to carry, feed, paste and sever a stay strip of the width of two inches fed at right angle to the line of the corner of the box, will be any more economical, or any more inconveniently or less effective than a stay strip of the proper width or of a width corresponding to the severed strip fed at right angles that is fed from the rear.

Ans. I don't understand the question.

Cross-int. 174. Would there be any difference in the appearance or the effectiveness of a strip applied to the corner of a box by either or both of the methods referred to in my last previous question?

Ans. The result would be the same.

Cross-int. 175. In both cases, whether the strip is fed from the side or from the rear, they are both severed, are they not?

Ans. They are.

Cross-int. 176. And whether fed from the side or from the rear, the machines in both instances are adapted to be regulated to sever the strip of the desired length to be applied. Is not such the fact?

Ans. Such is the fact, except that in the case of the side-feed machine I should speak of the stay as being of the proper width, and in the rear-feed machines as being of the proper length.

Cross-int. 177. But you have already stated, have you not, when they are applied, they are of the same length and of the same width, whether fed from the side or the rear, providing the adjustment or the severing of the strip, are set correspondingly for the width and length?

Ans. The piece of stay, when applied to the box, would be of the same dimensions as to length and width in either case.

Cross-int. 178. Then the simple word "yes" would have been a proper and complete answer to my last previous question, would it not?

200

Ans. Yes.

Cross-int. 179. The corner-staying machines constructed by yourself and the concern with which you are connected, one of which is already in evidence in this case, is adapted to feed the stay strip of paper or muslin from the side or at right angles with the corner of the box. Is not such the fact?

Ans. Such is not the fact.

Cross-int. 180. On the contrary, adapted to feed from the rear?

Ans. It is.

Cross-int. 181. Are you willing to swear that the so-called Ku
ton machine would be inoperative as a corner-staying machi
the folder was left out, and a flat surface pasting wheel substit
in lieu of the V-shaped pasting wheel that you say it contains?
Ans. In my opinion the machine would not be operative.
Cross-int. 182. Have you ever tried it?
Ans. No, sir.

CLARENCE W. HOBB

Attest: CHARLES P. SEARLE, [SEAL.]
Special Examiner and Notary Public.

Deposition of Fred H. Beach.

Direct examination by EDWARD S. BEACH, Esq., of co
for the defendants:

Int. 1. Your full name?
Ans. Fred H. Beach.
Int. 2. Are you the complainant in this suit? And the Fre
Beach named in the letters patent in suit?
Ans. I am.
Int. 3. How many box-corner staying machines made in ac
ance with the drawings of the reissued letters patent in suit
been constructed by you, or caused to be constructed by you?

(The question is objected to as indefinite and as immaterial
the reason, among other things, the patentee or the owners op
ing under the patent by the terms of the specification and cl
are entitled to a latitude beyond what is shown in the drawi
and still be within the terms of the patent upon which this s
based. Consequently any form or modification that might be
from time to time, if such embraces the fundamental parts embr
within the several claims of the patent, such machines
201 nevertheless under and in accordance with the patent,
in such cases and particularly in this instance, would b
patented machine of complainant.)

Ans. I cannot state positively the number, but it is consider
in excess of 300.
Int. 4. Do you mean to say that there have been 300 box-co
staying machines made with pieces and parts identical with
pieces and parts of the machine illustrated in the patent draw

(The question is objected to as improper and misleading.)

Ans. If you mean by identical that the pieces and parts
exactly the same shape as those in the drawings referred to, I sh
say, no.
Int. 5. How many of the machines in question have you ma
caused to be made with a side feed, as shown in your patent?

(Same objection as made to the third interrogatory.)

Ans. Somewhere between twenty and thirty.

Int. 6. When did you make your first box-corner staying machine described in your patent?

Ans. In the spring of 1885.

Int. 7. Did you make any more machines identical with this first machine?

Ans. I have made a great many machines containing the same elements and combinations of elements as those contained in that first machine.

Int. 8. That is not my question. Did you ever duplicate that first machine in manner and form in which the first machine was constructed?

Ans. No, sir.

Int. 9. What became of the twenty or thirty side-feed machines referred to?

Ans. They were all, or nearly all, of them sold to box-makers.

Int. 10. Have you ever altered them over, or made any changes of any kind in them?

Ans. I think not, only to repair them.

Int. 11. Don't you know whether you have or not?

Ans. I don't remember of making any changes in them any further than to repair them.

Int. 12. Have any of those twenty or thirty side-feed machines been returned to you or your associates?

Ans. They have, in exchange for other machines as part payment.

202 Int. 13. You are in partnership with Mark D. Knowlton, are you not?

Ans. Yes, sir.

Int. 14. It is a fact, is it not, that nearly all of the 300 machines that you have referred to are back-feed machines, and contain means for bending the stay strip transversely on its way between the clamping dies?

Ans. Yes, a large majority are such machines.

Int. 15. Your patent and the Exhibit Knowlton Patent are both assets of the firm, are they not?

(Objected to as immaterial.)

Ans. No, sir.

Int. 16. Which one is?

(Objected to as immaterial and irrelevant, and as presumptive and improper.)

Ans. Neither one.

Int. 17. Is the firm of Beach & Knowlton working under a license from you?

(Objected to as immaterial and irrelevant.)

Ans. I don't know whether it would be called a license or not. We have a partnership agreement.

Int. 18. Will you please produce a copy of that partnership agreement?

(The question is objected to and the witness is *requested* that he may at his option refuse, except otherwise ordered by the court.)

Ans. I cannot see what the agreement between Mr. Knowlton and myself concerns this case in any way, and I shall therefore decline to produce the agreement unless so ordered by the court.

Int. 19. Will you please state to the court what provisions the partnership agreement contains, so far as relates or affects the title of the letters patent in suit?

(Objected to as immaterial and irrelevant.)

Ans. There is no provision in the agreement that affects the title of the patent in suit.

Int. 20. Has any one but the firm of Knowlton & Beach a right to make or sell the invention patented by the letters patent in suit?

(The question is objected to as improper in form and as presumptive.)

Ans. No.

Int. 21. What repairs did you make on the twenty or thirty machines, or any of them?

203 (The question is objected to as immaterial, for the reason that it usually follows that every machine with continued use requires repairs.)

(To which it is replied that they do if they are inoperative to begin with, whether they are used or not.)

Ans. I can't tell at this time just what the repairs were. Parts were broken, worn and replaced; I don't know just exactly when or what the repairs were.

Int. 22. Do you admit that any one has a right to use box corner staying machines of the patent in suit, without the consent of Knowlton & Beach?

(The question is objected to as highly improper and not calling for evidence, but for an opinion, a conclusion, therefore inadmissible as a question.)

Ans. No, sir.

Int. 23. Are any of your original side-feed machines now in use?

(Objected to as immaterial.)

Ans. Yes, sir; I think so.

Int. 24. How many?

(Immaterial.)

Ans. I cannot say positively.

Int. 25. To the best of your judgment?

(Objected to as immaterial and as already answered.)

Ans. I cannot say positively except as to one.

Int. 26. On how many of those old 20 or 30 side-feed machines have you put new attachments?

(Objected to as grossly leading and presumptuous and highly improper.)

Ans. What do you mean by new attachments?

Int. 27. Any pieces or parts not suggested by the patent in suit for the purpose of improving the practical operation of the machine?

Ans. Not any. The machine as first constructed worked practically and successfully.

(All after "Not any" is objected to as volunteered.)

Int. 28. What became of the old machines that you took back?

(Objected to as immaterial, as the question fails to distinguish between those worn out and those resold.)

Ans. Some of them we have in our store-room. Some of them were resold.

204 Int. 29. You formerly and before June 10, 1885, worked at Vick's seed warehouse, did you not, in Rochester, N. Y.?

(Objected to as leading and improper.)

Ans. I did.

Int. 30. You used to run a mailing machine at that establishment, did you not?

(The question is objected to as grossly leading and highly improper.)

Ans. I did not.

Int. 31. You used to see one in operation there, did you not, before June 10, 1885?

(Same objection.)

Ans. I have seen one in operation there before that time.

Int. 32. Please describe its main elements?

(Objected to as immaterial and irrelevant.)

Ans. There was a pasting mechanism, a feeding mechanism, operated by the thumb or finger, a cutting mechanism operated also by the finger or hand, and a pressing mechanism. I believe those were all the parts.

Int. 33. I believe your original application was prepared by Mr. R. F. Osgood, a patent attorney of Rochester. Is that correct?

(The question is objected to as immaterial and irrelevant, and also that the application itself would doubtless be the best evidence.)

Ans. Yes, sir.

Int. 34. I show you United States letters patent, No. 236,387, granted to C. T. Welch, January 4, 1881, for an addressing machine, and No. 303,922, granted August 19, 1884, to Dennis & York. I call your attention to the fact that the drawings in both these patents are signed by R. F. Osgood, attorney, that Welch resided at Bellona, Yates county, New York; that Dennis resided at Rochester, N. Y., and York at Geneva. Is there any doubt in your

mind about the R. F. Osgood whose signature appeared on the drawings being the R. F. Osgood through whom you filed your original application?

(The question is objected to as wholly immaterial, irrelevant, and furthermore as improper as to whether the Osgood referred to is or is not the Osgood who prepared or had to do with the application in question, and particularly unless the witness is certain that the Osgood whose names appear on the different applications is one and the same.)

Ans. I have no way of knowing whether this is the same Osgood, and did not know that those patents were prepared by Mr.
205 Osgood. I have talked with him repeatedly about my patent, and he never mentioned having prepared the patents referred to.

Int. 25. Have you any doubt about the identity?

(Objected to as improper, in not calling for a fact within the knowledge of the witness, and particularly in light of the answer just given by him.)

Ans. I know nothing whatever about it, whether it is the same Osgood or not.

Int. 26. Did you ever hear of more than one R. F. Osgood as patent attorney?

(The question is objected to as wholly immaterial and irrelevant, and moreover there might be a dozen, none of them, except possibly one, known to the witness, and it therefore does not follow, if the witness knew of but one of them, that he was the same one who had prepared or whose name appeared upon the different applications or patents.)

Ans. I know of only one R. F. Osgood.

Int. 27. Please answer my question now categorically: Have you any doubt that R. F. Osgood, who was attorney in the Welch and Dennis & York patents, was your attorney?

(Same objection, and as having been already answered.)

Ans. I do not know whether it is the same Osgood or not.

(Adjourned to 2 o'clock p. m.)

Cross-examination by JOHN DANE, JR., Esq., of counsel for complainant:

Cross-int. 28. Do you know whether there is another man by the name of Osgood in Rochester, a patent attorney or solicitor, by the name of Osgood other than the one whose signature appears upon or who prepared your application for a patent, to which your attention has been called on the direct examination?

Ans. There is another patent attorney in Rochester by the name of Osgood.

Cross int. 29. State whether or not all of the various machines for staying the corners of boxes, whether made by or for you, or by or

for Knowlton & Beach, contain the elements and combinations of the patent upon which this suit is based?

Ans. They did.

Cross-int. 30. State why some of the machines referred to in the 12th question were received in exchange for other machines as part payment. Was it because the old machines were worn by use, or because some of the concerns with whom the exchange was made desired larger, stronger or new machines in lieu of the old ones that had become worn by practical use?

Ans. Some of the machines exchanged had been in constant
206 use several years, and were nearly worn out. Some of them were exchanged because the party desired a stronger and a heavier machine, and I remember one instance where we exchanged one of the old machines for a foot-power machine; the parties desired to do night work on the machine, and had no power after 6 o'clock.

Cross-int. 31. Those machines that you received back in exchange that were resold, as stated in your answer to the 28th interrogatory, were disposed of to box manufacturers for practical use in staying the corners of boxes and covers thereto, in the manner and for the purposes originally intended?

Ans. Yes, sir.

Cross-int. 32. Did the labeling machine which you saw at Vick's seed store prompt or in anywise suggest to you the idea of inventing and constructing a machine for staying the corners of boxes with strips of paper or muslin automatically?

Ans. It did not.

Cross-int. 33. Do you consider, or does the concern Knowlton & Beach, consider, the corner-staying machine made and sold by said concern made under and in accordance with the Beach patent upon which this suit is based?

Ans. Yes, sir.

Cross-int. 34. Do the machines for staying the corners of boxes, as made by Knowlton & Beach, contain anything beyond what your patent and claims embrace, except the attachment which has been called or termed the former and bender, and possibly some inconsiderable and non-essential features that may possibly be of some slight advantage?

Ans. They do not.

Direct examination resumed:

Int. 35. Please to describe each element specifically of the corner-staying machine made and sold by the firm of Knowlton & Beach. Begin, if you please, with the reel, and state whether the machine is a back or a side feeder?

Ans. The machines made by Knowlton & Beach mostly feed from the back, although we advertise for sale the machine feeding from the side, and they consist of a reel mounted on a bracket to hold a roll of staying material, a bender, a paste-wheel, a feeding apparatus, a cutter for severing a strip of suitable length, and a die

or plunger for pressing the stay strip upon the interposed corner of the box.

The strip is fed forward by a pusher or foot, and the paste-
207 wheel has an angular or V-shaped edge, the anvil or die on which the box rests has an angular feed to conform to the corner of the box; the pressing die is also angular to conform to the outside of the box to press the stay.

Int. 36. What provision, if any, is made in the Knowlton & Beach machines for regulating the extent of the feed?

Ans. The feed is regulated by a cam. The feed-arm is attached to the anvil or lower die.

Int. 37. Why is that necessary?

Ans. It is for the purpose of staying boxes of varying depths.

Int. 38. Was there any provision of this sort in your original Beach machine made under letters patent herein in suit?

Ans. The original machine, or in other words, the first twenty or thirty machines, were made to feed from the side. Consequently there was no necessity for changing the feeding apparatus, but there was an arrangement for staying boxes of different depths.

Int. 39. Explain to the court the necessity of having means for changing the feed in back-feeding machines.

Ans. It was for the purpose of staying boxes of varying depths.

Int. 40. Why is it necessary to make an adjustment for the purpose of staying boxes of varying depths?

Ans. To put the stay the full depth of the box.

FRED H. BEACH.

Attest: CHARLES P. SEARLE,
Special Examiner and Notary Public.

Deposition of Rufus B. Fowler.

Direct examination by EDWARD S. BEACH, Esq., of counsel for the defendants:

Int. 1. Your name?

Ans. Rufus B. Fowler.

Int. 2. You have heretofore testified in this suit, have you not, and been qualified as an expert in patent causes? Is it a fact that the Beach reissue in suit is the first patent descriptive of a machine for attaching stay strips to the corners of paper boxes?

Ans. I have before testified in this suit, and have been qualified to testify as an expert. It is not true that the patent in this suit is the first patent showing and describing a machine for the
208 purpose of attaching a stay strip to a paper box in order to unite the corners of the box.

Int. 3. Please to give your reasons for your preceding answer.

Ans. Letters patent of the United States No. 52432, granted to C. A. Maxfield, February 6, 1866, for a paper-box machine, shows and describes mechanism designed and adapted to attach a stay strip to the corner of a box in the manner illustrated in said patent, in Figs. 4 and 5 of the drawings of the patent. The preamble of

the specification says: "My invention relates to a mechanism for pressing a strip of glued paper upon the edge of the box at the junction of the bottom and sides, or rim and lid." And the specification further says: "This strip of material forms a union of the bottom or top and sides of the box, as indicated in Fig. 4." Letters patent of the United States 25373, granted to S. B. Terry, September 6, 1859, also shows and describes a machine provided with mechanism for applying a stay strip to the corner of a box; a portion of the stay strip being applied to the side of a box, and the remaining portion turned over the corner and applied to the bottom of the box, thereby uniting the side and bottom of the box, and I now produce printed Patent Office copies of the two letters patent to which I have just referred, viz, letters patent 52432, granted to C. A. Maxfield February 6, 1866, and letters patent 25373, granted to S. B. Terry, September 6, 1859.

Int. 4. I now hand you United States letters patent No. 236,387, to C. T. Welch, January 4, 1881, for an addressing machine; No. 303,922, to Dennis & York, August 19, 1884; No. 67833 to Zacharias, August 13, 1867; No. 84223, to C. B. Sill, November 17, 1868, for attaching labels; No. 148,103, to Bailey, March 3, 1874; and No. 217,685, to Farquharson, July 22, 1879, for an addressing machine.

(Adjourned to April 21, 1894.)

Second Deposition of Rufus B. Fowler.

BOSTON, *April* 21, 1894.

Met pursuant to adjournment.

Present: Edward S. Beach, Esq., for defendants. Mr. Dane absent, but by stipulation, examination to continue, with the reservation of all rights of objection in cross examination on the part of Mr. Dane.

209 Int. 4 (continued). Please state what bearing, if any, the patents handed you have upon the subject-matter of the first, second, third and sixth claims of the patent in suit.

Ans. I have carefully examined the several patents handed me and referred to in the interrogatory. I find the patent to Welch, 236,387, to contain the combination, with opposing clamping dies, a feeding mechanism constructed to deliver a continuous paper strip between the clamping dies and a pasting mechanism for rendering the continuous paper strip adhesive, and in this respect it shows, broadly considered, exactly the same combination as stated in terms in claim 1 of the patent in suit. The only difference which is to be found between the combination described in claim 1 of the patent in suit and that shown in the patent to Welch being that the clamping dies described in claim 1 of the patent in suit have diverging working faces, while the clamping dies shown in the patent to Welch have plane faces. If the clamping dies shown in the patent to Welch were provided with diverging working faces, claim 1 of the patent in suit would then, in terms, apply to the combination shown

in the patent to Welch. The patent to Welch further shows a cutter for severing the continuous paper strip into short strips or pieces, and if the clamping dies of Welch had diverging working faces, then claim 2 of the patent in suit would in terms, and broadly considered apply to the combination of corresponding elements shown in the patent to Welch, and what I have said with reference to claims 1 and 2 of the patent in suit are equally applicable to claim 3 of said patent. Fig. 3 of the drawings of the Welch patent shows a longitudinal vertical section of the machine, and discloses with clearness the operating parts of the machine. Referring to Fig. 3 of the Welch patent I find a continuous paper strip indicated by the reference letter S carried upon a reel J, exactly corresponding to the reel K shown in Fig. 2 of the patent in suit. Continuing the comparison between Fig. 3 of the Welch patent and Fig. 2 of the patent in suit, I find the continuous strip in both machines to be taken from the reel to a pasting mechanism, by which one side of the continuous strip is pasted or rendered adhesive, and to a feeding mechanism, by which the continuous strip is fed forward with an intermittent motion; the feeding mechanism in the Welch patent (Fig. 3) being represented by the feeding rollers K and L, which are pressed together in order to produce the desired pressure on the paper strip to feed it forward; these two rollers K and L corresponding exactly in their purpose and mode of operation to the feed-rollers M and N, shown in Fig. 2 of the patent in suit. In the Welch patent paste is applied to the under side of the continuous paper strip by a pasting mechanism consisting of a paste cup M, a roller Q bearing against the under side of a rubber band carried upon the rollers N and O, so as to meet the surface of the band which, as it passes over, communicates the paste to the under side of the continuous paper strip. From the pasting mechanism the continuous paper strip is conducted over the stationary cutting knife, or shear plate *d*, and beneath the reciprocating knife *e* and reciprocating platen or upper die *f*; as the knife *e* moves downward, and against the cutting edge of the shear plate *d*, it severs the continuous paper strip, and the piece so cut off will be carried down by the reciprocating movement of the plate *f*, and pressed against the article laid upon the bed X; the reciprocating platen *f* performing precisely the same function conjointly with the bed X in attaching the adhesive strip which has been severed from the continuous paper strip, as is performed by the clamping dies described in the patent in suit. The only difference between this part of the Welch machine and the corresponding part of the patent in suit consisting solely and entirely in the fact that the bed X of the Welch patent is a flat surface, and the face of the platen *f* has also a plane or flat surface, while the clamping dies of the patent in suit are provided with diverging working faces, being made in that form which would obviously be required by the character of the work to be interposed between them; in other words, while the dies of the Welch machine are required to press upon work having a flat or plane surface, the dies of the patent in suit are required to press upon work having an angular surface. Therefore,

it appears to me clearly obvious and within the province and skill of even the most ordinary mechanic that the dies in the one machine must necessarily be flat, and that the dies in the other machine must necessarily be angular, or have "diverging working faces." In order to adapt the addressing machine shown in the patent to Welch to the purpose of applying the stay strip to the corner of the paper box, it would only be necessary to change the clamping dies and substitute for those of Welch other clamping dies having "diverging working faces," such, for example, as those shown in the patent to Waters, reissue 1212, and in figures 7, 8, 9 and 10 of the drawings, or in the patent to Cohn, 148,416, in figures 2 and 3 of the drawings, referred to in my previous testimony.

211 If the Welch machine were provided with clamping dies having diverging working faces, as I have suggested, in place of a plane die, then the Welch machine would fall within the scope of claims 1, 2 and 3 of the patent in suit, broadly considered, or without reference to the specific construction and operation of the individual elements forming the combination of said claims; and the Welch machine would be removed from the scope of claims 1, 2 and 3 of the patent in suit, only by inserting in said claims, after the enumeration of each of the elements mentioned therein the words "substantially as described," thereby limiting the scope of said claims 1, 2 and 3 to the combination of the specific elements each constructed and operating as described in the patent in suit, for the reason that the Welch machine is distinguished from the machine described in the patent in suit only by the specific differences of corresponding elements considered with reference to their construction and mode of operation; for, with the change in the form of the clamping dies, the Welch machine would have precisely the same elements, each performing precisely the same function in kind, and arranged in precisely the same combination as are described in terms in claims 1, 2 and 3 of the patent in suit. The Welch machine, in its present form, is fully adapted to stick an adhesive strip of paper upon the flat side of a paper box, and if it were required to stick the adhesive strip upon the corner instead of the flat side, it would only be necessary to change the form of the clamping dies, by making them conform to the shape of the work to be acted upon, or by using angular dies; or, if the adhesive strip were to be stuck upon the convex side of a circular box, the faces of the dies would then obviously require to be curved corresponding to the curvature of the box; and in view of the fact that the shape of the clamping dies is suggested by, and determined by the shape of the work to be acted upon, I do not think it would require invention to determine what the particular form of the clamping dies should be in each particular case; or, that having the Welch machine as a starting point, one would be entitled to patent by reason of his changing the form of the dies from plane to angular; or that another would be entitled to a second patent because he had changed the form of the dies from plane to curved; in both cases the builder of the machine would know the form of dies required in each particular case the moment he saw the work to be acted upon. The

office of the clamping dies is, first, to make the adhesive stay strip conform to the angular shape of the box corner, and sec-
212 ondly, to make it adhere to the box, and it was therefore necessary that the clamping dies be shaped to correspond with the shape of the box, and that they be capable of exerting a pressure upon the stay strip and box interposed between them; and this function of the clamping dies is precisely the same as the function of the bed X and reciprocating platen *f* in the Welch machine. When the continuous paper strip X X has been wet or pasted upon one side, the fibers of the paper are first expanded and subsequently contracted, causing the paper to curl, and as the severed strip is pressed between the dies of the machine it becomes straightened, or made to conform to the plane, flat surfaces of the clamping dies precisely as the stay strip is made to conform to the angular surfaces of the clamping dies of the patent in suit; the dies in both cases being both shaping and pressing dies. The Welch machine shows the lower die, or bed X, inclosed within a "square cavity or socket," for the purpose of receiving a pile of papers on which the severed adhesive strips are to be pasted; the bed or follower X being capable of moving upward, as actuated by a rack and pinion; but the presence of the cavity or socket W and the device for raising the follower does not in any way change or modify the operation of the clamping dies; the follower X forming the lower or stationary die and the platen F forming the upper or reciprocating die, and the Welch machine, as shown and described, possesses the same elements, each performing the same office in the combination, and all combined in the same manner, when considered broadly, as are found in the "Defendants' Exhibit Hobbs' Modified Machine," both containing a pasting mechanism, a feeding mechanism, a cutting mechanism, and a pressing mechanism, all adapted to work upon a continuous strip.

The patent of Dennis & York, 303,922, shows the same combination of elements in terms as are set forth in claims 1, 2 and 3 of the patent in suit. It shows a reel D on which a continuous strip of paper is wound, feeding mechanism, consisting of the rolls C C having an intermittent motion; a pasting mechanism comprising the pasting rollers E E', which take paste from the paste-tank B and apply it to the under side of the continuous paper strip P, as it is fed along by the action of the feeding rollers C C. The continuous paper strip, after it has been rendered adhesive on the under side, is severed by the action of the cutting mechanism consisting of a reciprocating knife F, and a fixed shear F', and the severed strip is pressed down and stuck upon the lower die or "fol-
213 lower S." The Dennis & York machine embodies precisely the same combination as set forth in claims 1, 2 and 3 of the patent in suit when broadly considered. The "follower S" rests upon springs *y y*, which are supported upon the supplementary follower or head T; the purpose of the springs *y y* is to allow the follower S to yield and adapt itself to any thickness of papers or other articles to which the severed strips are to be attached from a single sheet up to a great number of them, piled one on top of an

other, the spring action producing just enough pressure under all circumstances to receive the pasted slip upon the upper sheet, thereby securing a yielding pressure, which is exactly the office of the coiled spring *h* of the patent in suit, and the clamping dies shown in the Dennis & York machine are dies constructed to co-operate impressing an adhesive strip, one of said clamping dies being constructed to act with an elastic or yielding pressure; and it therefore embodies the invention set forth in claim 6 of the patent in suit; it only being necessary to meet the combination of claim 6, in terms, that the clamping dies have diverging working faces, or that angular clamping dies, such as shown in Figs. 7, 8, 9 and 10 of the patent to Waters, reissue be substituted for the flat dies shown in the patent to Dennis & York; or that the dies shown in Figs. 2 and 3 of the patent to Cohn, 148,416, be substituted for the dies of Dennis & York; or that the form of the dies be made to conform to the shape of the work. The patent to Dennis & York showing the same elements and the same combination of elements in terms as are shown in "Defendants' Exhibit Hobbs' Modified Machine."

The patent to Zacharias, 67833, shows a reel for carrying a continuous paper strip, pasting mechanism, by which paste is applied to one side of the continuous strip, feeding mechanism for feeding the continuous strip with an intermittent motion, cutting mechanism, by which the continuous strip is severed, and pressing mechanism, by which the severed piece is pressed upon the article to which it is to be attached. The machine described in the patent to Zacharias is designed to attach labels to newspapers, pamphlets and other articles, and it is therefore provided with a pressing or clamping mechanism having plane surfaces adapted to the form or shape of the work to be acted upon, and the substitution of clamping dies having diverging broken faces for the plane clamping dies shown in the patent to Zacharias would adapt the machine to press the severed adhesive strip upon an angular surface, such as the corner of a paper box, and if such substitution were made the com-
214 bination shown in the patent to Zacharias would be met by claims 1, 2 and 3 of the patent in suit.

The patent to Sill, 84223, shows a reel for holding a continuous paper strip provided on one side with adhesive gum; it also contains a device for moistening the strip on its gummed side to render it adhesive, it has a cutting mechanism for severing the continuous strip, and pressing mechanism for pressing the severed strip upon the document or article to which it is to be attached. Figure 1 of the patent to Sill is a vertical, longitudinal section of the machine clearly showing the construction and arrangement of the several parts, showing a reel F on which the continuous strip is carried, a water box B containing a sponge *a* in contact with the under side of the continuous gummed strip, a feeding mechanism consisting of a feed-wheel *g*, which is rotated intermittently, a cutting mechanism consisting of a stationary steel plate e^1, and a reciprocating steel plate carried by a press plate D, the steel plate *e* acting conjointly with the stationary steel plate e^1 to sever the continuous paper strip into pieces of the desired length as determined by the intermittent

rotation of the feed-wheel *g*. The severed strip is carried down toward a bed plate A by the reciprocating motion of a press plate D, by which pressure is applied to attach the gummed strip to an article lying upon the bed plate A. The working faces of the bed plate A and the press plate D are plane surfaces adapted to the purpose of attaching labels, and the Sill machine, as shown and described, contains the combination with opposing clamping dies of a feeding mechanism constructed to deliver a continuous gummed strip between said clamping dies, mechanism for rendering the continuous paper strip adhesive and cutting mechanism for severing the continuous strip into strips of suitable length; and the combination of these parts in the Sill machine requires only the substitution of angular clamping dies for the plane clamping dies shown by Sill to bring it within the scope of the combination described in each of claims 1, 2 and 3 of the patent in suit.

The patent to Bailey, 148,103, is for a machine containing a paper roll, pasting trough, pasting rollers and shears combined and arranged so that the operator can turn the pasting rollers and draw the printed strip of paper from which the slips are to be cut through the pasting apparatus to the shears. Figure 3 of the Bailey patent is a longitudinal sectional view showing a continuous strip of
215 paper B held upon a roll A, and conducted between feeding rolls I and F, the feeding roll F also serving to carry paste from the paste-box E to the under side of the continuous paper strip; from the feeding and pasting mechanism the paper is projected between the stationary cutter N and the movable cutter O by which the continuous strip is severed into suitable lengths, and delivered between the bed of the machine and the reciprocating clamping die N^1. Each of the elements in the Bailey machine performs the same function in kind as the corresponding element of the patent in suit, and the feeding mechanism of the Bailey machine possesses certain features in common with the feeding mechanism of the patent in suit; the feeding of the continuous strip in both machines is accomplished by the intermittent rotation of a pair of feed-rolls; in both machines the lower feed-roll is provided with circumferential grooves. The Bailey machine is "provided with tines or fingers *n*, which extend, respectively, over the paste-roller and into the circumferential grooves of the same," and the patent in suit is provided with "a series of parallel bars or wires 1 1 1, Figs. 11, 12 and 13, which are secured at their ends in the frame at either side of the rollers M and N, the lower feed-roller N is mounted to turn freely in its bearings, and is provided with a plurality of circumferential grooves to receive the bars or wires 1 1 1. If the Bailey machine were provided with angular clamping dies in place of its plane clamping dies, it would present the same elements and in the same combination, and capable of performing the same function, as are described in claims, 1, 2 and 3 of the patent in suit.

The patent to Farquharson, 217,685, discloses in Fig. 2 of the drawings, a reel *l* for carrying a continuous strip of paper —, a paste-roller 5 running in a paste-box 21, and delivering paste to the

under side of the continuous paper strip, a feed-roll 4, to which an intermittent rotary motion is imparted for the purpose of feeding the continuous paper strip over a stationary knife 6, and beneath a reciprocating knife blade 16, by which the continuous paper strip is severed and delivered beneath a reciprocating stamp 7; the downward motion of the stamp 7 carrying the severed strip downward upon the surface of the article to which it is to be attached held upon the surface 26. The Farquharson machine contains the same elements as the patent in suit, and these elements are combined and operate to perform the same function in kind as the several elements of the patent in suit, and if the Farquharson machine were provided with angular clamping dies in place of the
216 plane clamping dies shown in the Farquharson patent, then the Farquharson machine would be met and covered by claims 1, 2 and 3 of the patent in suit, and it would show an operating machine capable of applying adhesive stay strips to the corners of a box by means of mechanism which would be accurately described by claims 1, 2 and 3 of the patent in suit.

The patents to which my attention has been directed by the question, to wit: the patents to Welch, Dennis & York, Zacharias, Sill, Bailey and Farquharson, all show and describe machines for feeding, pasting, cutting and pressing continuous strips and if the plane clamping dies of these several machines were made of angular shape, such as are shown in the patent to Waters, reissue 1212, or the patent to Cohn, 148,416, then each of these machines would be accurately described by the language of claims 1, 2 and 3 of the patent in suit, for they would each and all possess, in combination, opposing clamping dies having diverging working faces, a feeding mechanism constructed to deliver stay strips between said clamping dies, a pasting mechanism for rendering the stay strips adhesive, a cutter for severing the continuous strip into stay strips of suitable lengths, and the clamping dies would be constructed to co-operate in pressing the adhesive stay strips upon interposed box corners. The only change that would be necessary to be made in each of the several addressing machines which I have just reviewed to bring it within the terms of claims 1, 2 and 3 of the patent in suit would be to exchange the plane dies of the addressing machines for dies having diverging working faces, or to adapt the shape of the clamping dies to the character of the work, and this change would be suggested and determined by the work itself, without requiring the exercise of invention.

Int. 5. Mr. Brevoort, in answer four of his deposition, in reply says: "I have no doubt that such change can be made in the shape of the dies, as the Hobbs modified machine shows; but when such modification is made the Beach invention has been departed from, because the mechanism thus produced is no longer adapted to operate on corners of boxes for the purpose of attaching stay strips to those corners. As I understand the Beach patent, it is limited in this regard to a machine having as one of its elements dies suitable for this particular purpose as distinct from any other kind of dies which might be adapted to some other or different purpose."

Now, will you please state whether or not there is a
217 thing contained in defendants' exhibits which fortifies y
opinion that there is no patentable invention in "having
one of its elements dies for this particular purpose," as Mr. Brevo
calls it, "as distinct from any other kind of dies which might
adapted to some other or different purpose." If so, state what y
find in the exhibits and point out the same in detail.

Ans. The Defendants' Exhibit "Hobbs Modified Machine,"
precisely the same in all its elements, and in their combination,
the defendants' machine, except that the defendants' machine h
angular-shaped dies, and the Hobbs modified machine has plane
flat-shaped dies; the difference between the two machines cons
solely in the difference in the clamping dies, and this difference
the clamping dies is a difference in shape only—that is, in one m
chine they are flat, and in the other machine they are angular, a
this difference in shape I understand Mr. Brevoort to consider
patenable difference, and not only a patentable difference, but t
specific patentable difference, or, in other words, that a machi
constructed and operating like the Hobbs modified machine wou
not infringe the patent in suit, and that a machine constructed li
the Hobbs modified machine might be used to operate upon a co
tinuous strip of paper to paste, feed, cut and stick adhesive stri
upon the flat side of a box such as a label, for example, and th
such use would not constitute an infringement of the patent in su
but that the moment the plane dies of the Hobbs modified machi
were made angular to adapt them to the shape presented by t
corner of a box, and the adhesive strip be stuck upon the corn
instead of the flat side of the box, the change would bring the m
chine and its use within the scope of the patent in suit. This po
tion of Mr. Brevoort's appears to bring the field of invention co
tained in the Beach patent down to the narrow limits of simp
changing the form of the dies, for such change is the only o
found between defendants' machine and the Hobbs modified m
chine. It is not pointed out by Mr. Brevoort nor even claimed b
him that the function of the remaining elements, or their co-oper
tive action, is in the least modified or affected by this change in th
shape of the dies, which to Mr. Brevoort's mind, appears sufficie
to bring one machine within the scope of the patent in suit, a
to take the other machine out of it. Now, the function of the clam
ing dies in the defendants' machine and in the Hobbs modified m
chine, as in each of the addressing machines, to which I ha
218 just referred, and as in the Waters pepper-box machin
reissue 1212, is to shape and press the material interpos
between them and to my mind it appears obvious that it wou
come within the province and skill of an ordinary mechanic
shape the dies to suit the work. The action of the clamping di
in pressing the material interposed between them is precisely th
same in kind as the pressing action of a great variety of machin
employed in shaping, pressing and embossing articles of vario
kinds or well known in the arts and in which it has been customa
to make the faces of the jaws or dies shaped to correspond with th

work to be operated upon; and I understand Mr. Brevoort's position to be that when the clamping jaws or dies are shaped to adapt them for one purpose or kind of work, it would require invention in order to change their shape for the purpose of adapting them to other and different forms of work. I do not agree with this conclusion of Mr. Brevoort's, for the reason that a simple change in the shape of the clamping dies would obviously be suggested by the character of the work upon which the dies were to act, and even if such were not the case the substitution of angular for plane dies is obviously suggested by figures 7, 8, 9 and 10 of the patent to Waters, reissue 1212, in which figure 9 shows such a pair of clamping dies provided with diverging, working faces, and with a corner of a box interposed between them. Moreover, if a mere change in the form of the working faces of the clamping dies involves invention, then a patent might justly be claimed for every variation made in the shape of the dies; as, for example, a patent might be claimed, according to Mr. Brevoort's idea, for changing plane dies to angular dies, another patent for changing angular dies to circular dies, another patent for changing circular dies to elliptical dies, and, for a similar reason, patents might be claimed for each change in the angularity of the dies, or for each change in the curvature of the face of the dies. The construction and operation of the Dennison tag machine of Sawyer's 1875 model, and of the machine shown in Sawyer's 1875 patent of the Waters machine, and of the several addressing machines to which I have just referred were sufficient, in my opinion, to settle any question as to the operation or utility of the Beach machine without further experiment; and they not only settled this question, but they presented all the elements in the same combination as shown in the Beach machine, with each element of the combination performing the same function in kind as performed by the several elements in the Beach machine,
219 and having the same co-operative action as the elements in the Beach machine; the only modification necessary to be made being to change the shape of the dies to suit the shape of the work, and this change in the shape of the dies required only the adoption of the shape shown in the patent to Waters. I fully agree with Mr. Brevoort that the Beach patent is limited to a machine having as one of its elements dies suitable for the particular purpose of sticking an adhesive strip to the corner of a box, but I am of the opinion that it requires no invention to make the requisite change in the form of the dies in order to adapt them to the particular purpose of sticking the adhesive strip upon the corner of a box instead of upon the flat side of the box; and the Beach patent, in my opinion, is further limited to the specific construction and arrangement of the individual elements in the combination described in claims 1, 2 and 3, or, in other words, that the invention embodied in claims 1, 2 and 3 can only be expressed in the terms of said claim by substituting immediately after the enumeration of each element of said claims the words "substantially as described," as stated by the patentee in his letter to the Commissioner of Patents accompanying his amendment to his application filed January 3rd, 1891,

and as disclosed by Defendants' Exhibit Certified Copy File-wrapper and Contents, Beach's Original Patent, No. 447,225.

Mr. Brevoort says: "The Beach reissue, as I understand it, and as the question states, is the first patent descriptive of a machine for attaching stay strips to the corners of paper boxes." This position is incorrect and unwarranted in view of the patent to Terry, 25373, and also in view of the patent to Maxfield, 52432, in which figures 4 and 5 show box corners having stay strips attached thereto, and the drawings and specification disclose a mechanism designed and adapted to automatically attach a corner stay strip such as those shown in figures 4 and 5 of the patent; but even if it were true, as it is not true, that the Beach machine was a pioneer machine in its class, I do not therefore understand that the inventive act, in view of the prior state of the art, becomes any the less necessary, or that the employment of an addressing machine, like that of Sill, or like that of Welch, for the purpose of sticking an adhesive strip on the corner of a box, instead of its side, would constitute invention, although such use was the first employment of an addressing machine for such a specific purpose, for such use would be merely
220 a double use, and for that reason I consider it necessary that the Beach machine be found to embody some modification or change or adaptation, which in itself involved invention in its conception and practical embodiment as a co-operating part of the machine, and after a careful examination of the Beach machine, I am unable to find any change or adaptation of its individual elements considered individually or co-operatively and in combination with each other, which warrants the assumption of invention as set forth in claims 1, 2, 3 and 6 of the patent in suit; and I am also fully of the opinion that if there be any invention whatever in the combinations described in claims 1, 2, 3 and 6, such invention must inhere in and attach to those peculiar and specific features of construction as will serve to distinguish the Beach machine from other similar combinations disclosed by the state of the art, and to my mind the mere change in the form of the clamping dies is not such a change as would involve invention or confer patentability upon the Beach machine, and upon a careful review of the testimony of Mr. Brevoort, I find no other change or modification singled out as involving invention except that of changing the shape of the clamping dies.

Mr. Brevoort's position appears to me to be briefly this: (1) He considers Beach to be a pioneer inventor in this class of machines; (2) that while each of the elements in his combination might have previously existed, he was the first to combine them in a single machine, so they would have the co-operative action disclosed in the patent in suit; (3) that while the Defendants' Exhibit Hobbs Modified Machine shows all of the several elements embodied in the Beach machine, to wit: pasting, feeding, cutting and pressing, and it also shows them combined in precisely the same manner as in the defendants' machine, still he does not consider the Hobbs modified machine to come within the scope of the patent in suit, for the reason that it does not have angular clamping dies instead

of plane clamping dies, deeming, as he says, the angular clamping dies essential to the Beach invention. To these positions of Mr. Brevoort's I reply: (1) The patent in suit is not the "first patent descriptive of a machine for attaching stay strips to the corners of paper boxes." As I have pointed out the Terry and Maxfield patents are each "descriptive of a machine for attaching stay strips to the corners of paper boxes;" (2) it is not true that the patent in suit is the first to disclose the combination in a single machine of mechanisms for pasting, feeding, cutting and pressing a con-
221 tinuous strip. Each individual element of the combination disclosed by the patent in suit was old, and the combination, precisely in the same manner as they are combined in the patent, was also old; (3) the mere change in the form of the clamping dies from the plane dies shown in the Hobbs modified machine, which Mr. Brevoort admits does not infringe the patent, to the angular dies found in defendants' machine, is not sufficient to constitute a patentable difference, for the reason that such change is one obviously suggested by the character of the work, and did not require invention to make it in view of the prior state of the art.

Int. 6. I hand you Defendants' Exhibit Knowlton Patent and File-wrapper, and call your attention especially to Knowlton's original claim 15, and to claim 6 in his amendment filed November 12, 1888, and ask you to state whether you find in said file-wrapper anything fortifying your opinion that the subject-matter of the first, second and third claims of the Beach reissued letters patent in suit do not contain any patentable novelty.

Ans. I find by an examination of the file-wrapper and contents of the Knowlton patent to which my attention is directed by the question, that claim 15 of the original application was for "a stationary anvil block or die, an opposing movable die and a stationary knife or cutter acting in connection with a cutting edge upon said movable die," or for the combination in a machine of clamping and cutting mechanisms, so arranged that when the end of a continuous paper strip is inserted between the dies, it will be both severed and pressed by the reciprocating motion of the movable die. This combination set forth in said claim 15 was found to be met in the patent to Sill, 84223, and it was accordingly rejected by office letter of October 24, 1888, and this rejection was acquiesced in by the applicant. Claim 6 contained in the amendment of November 12th, 1888, was as follows: "The combination, with opposing clamping dies, of means substantially as described acting upon the strip to advance the same toward the clamping dies, and means substantially as described for applying adhesive substance to the strip." This claim being for a combination of pressing mechanism, feeding mechanism and pasting mechanism, and it was found to be embodied in the patent to Sill, 84223, and was accordingly rejected by office letter of December 6, 1888, and the rejection was acquiesced in by the applicant. These two claims, original 15 and claim 6 of the amendment of November 12, 1888, are like the claims 1,
222 2 and 3 of the patent in suit when considered broadly and are open to the same objection as were made by the Patent

Office to the claims of the Knowlton application above referred to, and the combinations set forth in claims 1, 2 and 3 of the patent in suit are in terms met by the patent to Sill, 84223, equally with said claims 15 and 6 of the Knowlton application; that is, the combination of claims 1, 2 and 3 of the patent in suit, as stated in the language of said claims, is, in my judgment, anticipated by the patent to Sill, 84223, and said claims contain no patentable novelty not shown in said patent to Sill, and this opinion is confirmed by the action of Patent Office with reference to said claims 15 and 6 of the Knowlton application.

Int. 7. Are you familiar with Jaegar's English patent, No. 5073, of April 5, 1888? If so, state whether or not the machine described and set forth in this British patent contains the subject-matter of Beach's claims 1, 2, 3 and 6 of the patent in suit.

Ans. The British patent to Jaegar referred to contains the combination described in claims 1, 2 and 3 of the patent in suit; said Jaegar machine showing opposing clamping dies having diverging working faces, a feeding mechanism constructed to deliver stay strips between said clamping dies, a pasting mechanism for rendering adhesive the stay strips, a cutter for severing the continuous fastening strip into stay strips of suitable length, all arranged in combination, as described in said claims 1, 2 and 3 of the patent in suit, the clamping dies of the Jaegar machine being constructed to co operate in pressing upon interposed box corners the adhesive stay strips.

The combinations described in claims 1, 2 and 3 of the patent in suit are fully described in the said Jaegar British patent, and are clearly shown in figures 1, 7, 8, 9 and 10. The combination described in claim 6 of the patent in suit is also found in the said Jaegar British patent, being described therein and disclosed by figures 9 and 10 of the drawings, in which a part of the upper reciprocating die is pressed downward by a spring so as to give a yielding pressure as the reciprocating die is brought down upon the box corner; the said Jaegar British patent showing the combination described in claim 6 of the patent in suit, or the "combination of opposing clamping dies having diverging working faces constructed to co-operate in pressing an adhesive stay strip upon an interposed box corner, one of said clamping dies being constructed to act with an elastic or yielding pressure," as set forth in said claim 6.

223 Counsel for defendant offers in evidence:

M. D. Knowlton's U. S. letters patent No. 447,955, granted March 10th, 1891, together with a certified copy of the file-wrapper and contents of said patent No. 447,955, the patent being annexed to the file-wrapper and contents, and the same is marked "Defendants' Exhibit Knowlton Patent and File-wrapper, C. P. S., spec'l ex'r."

Also:

U. S. patent No. 52432, granted February 6th, 1866, to Maxfield, marked "Defendants' Exhibit Maxfield Patent, C. P. S., spec'l ex'r."

U. S. patent No. 25373, to Terry, September 6th, 1859, marked "Defendants' Exhibit Terry Patent, C. P. S., spec'l ex'r."

U. S. patent No. 236,387, to C. T. Welch, January 4th, 1881, marked "Defendants' Exhibit Welch Patent, C. P. S., spec'l ex'r."

U. S. patent No. 303,922, to Dennis & York, August 19th, 1884, marked "Defendants' Exhibit Dennis & York Patent, C. P. S., spec'l ex'r."

U. S. patent No. 67833, to Zacharias, August 13th, 1867, marked "Defendants' Exhibit Zacharias Patent, C. P. S., spec'l ex'r."

U. S. patent No. 84223, to C. B. Sill, November 17th, 1868, marked "Defendants' Exhibit Sill Patent, C. P. S., spec'l ex'r."

U. S. patent No. 148,103, to Bailey, March 3d, 1874, marked "Defendants' Exhibit Bailey Patent, C. P. S., spec'l ex'r."

U. S patent No. 217,685, to Farquharson, July 22nd, 1879, marked "Defendants' Exhibit Farquharson Patent, C. P. S., spec'l ex'r."

Also British patent No. 5073, of April 5, 1888, to Jaeger, together with a certificate of the British patent office that the same has expired, and the patent and certificate are marked "Defendants' Exhibit Jaeger Lapsed Patent, C. P. S., spec'l ex'r."

Int. 8. You have heretofore expressed the opinion that the defendants' alleged infringing machine does not contain the mechanism of claims 1, 2, 3 and 6 of the letters patent in suit, substantially as set forth in said letters patent, and that it is not covered by said claims when construed with reference to the state of the prior art. Are you still of that opinion? If so, give your reasons for your answer.

Ans. I am still of the opinion, as expressed in my previous testimony, that the defendants' alleged infringing machine does not contain the specific elements as shown in the patent in suit, and in the combination of those elements as described in claims 1,
224 2, 3 and 6 of said patent in suit. The arrangement of the elements in the defendants' machine is different from that shown in the patent in suit; the specific feeding mechanism is different from and in fact belongs to an entirely different class from that shown in the patent in suit; the cutting mechanism is different in its mode of operation from the cutting mechanism of the patent in suit, and it is made to co-operate with the feeding mechanism for the purpose of holding the stay strip from backward movement during the reverse motion of the feeding mechanism. These features of difference, together with others which I have referred to in my previous testimony, show a marked difference between defendants' machine and that described by the patent in suit, both in construction and mode of operation.

RUFUS B. FOWLER.

Attest: CHARLES P. SEARLE, [SEAL.]
Special Examiner and Notary Public.

Further Evidence for Complainant.

Second deposition of Henry L. Brevoort.

Direct examination by JOHN DANE, JR., Esq., of counsel for complainant:

Int. 1. Are you the same Henry L. Brevoort who has previously testified in this case?

Ans. I am.

Int. 2. Have you read the second deposition of Rufus B. Fowler, taken April 18th, 1894; and have you examined, and do you understand the various patents referred to by him?

Ans. I have read the deposition of Rufus B. Fowler referred to in the question. I have examined the patents referred to by him, and I understand the same.

Int. 3. Please state whether the patents referred to by Mr. Fowler show the inventions of the first, second, third and sixth claims of the Beach reissue, No. 11167, dated May 26th, 1891, and state
225 any conclusion that you may reach. You may exclude from your consideration the English patent of Jaeger, No. 5073, of April 5th, 1888.

Ans. In my opinion, none of the patents which I am asked to examine show the inventions of the first, second, third and sixth claims of the Beach reissue. Before considering the patents separately, I will first state that Mr. Fowler's deposition proceeds under two assumptions. I have stated, in my previous deposition (and I now restate it), that Beach was the pioneer in the art of staying box corners with stay strips, running from the bottom to the top of the box, or part way, and in applying the same mechanically to the box in contradistinction to the old method, which consisted in applying such strips by hand, Mr. Fowler takes issue with me on this statement, and to prove the truth of his assertions he introduces in evidence two patents for putting a stay strip on the bottom of a round box, the stay strip being partly on the bottom and partly on the side of the said round box. The two patents which he introduces are the Maxfield patent and the Terry patent. They need not be separately considered, because these two patents propose to do substantially the same work upon round boxes. The foregoing is Mr. Fowler's first contention; and I answer that contention by saying that Beech's invention has no relation whatever to putting stay strips of any kind on round boxes, and the fact that stay strips happened to hold the bottom in position in such boxes in no way alters the fact that Beach was the first who ever conceived of the idea of mechanically applying stay strips to the corners of square boxes. Therefore, I reassert that Mr. Beach in his patent did, as a matter of fact, establish a new art, which had no relation to the old round-box art whatsoever, and he deserves, therefore, to stand in the position of a pioneer inventor in a new art.

I need not consider at length the Maxfield or Terry patents, because the above statement disposes of them effectually. Mechan-

ism which is applicable to applying stay strips to round boxes has no applicability whatsoever, to the application of stay strips to the corners of square boxes; and the fact that such machines as the Maxfield and the Terry patents describe existed long before the Beach invention, merely goes to show that the Beach invention was not at all an obvious one, or else it would have been practiced by mechanics long before the date when Beach invented it. The entire art,
226 as exhibited in this case, goes to show that the Beach invention was not an obvious one, but was one that mechanics in the box art never thought of, and Beach was the first man who taught box-makers mechanical means for applying stay strips to the corners of square boxes. There can be no dispute that the invention is a valuable one, and a highly useful one; and the art clearly shows that it was not an obvious one.

I have now disposed of the first portion of Mr. Fowler's deposition. The next portion of Mr. Fowler's deposition considers a number of patents for attaching labels on newspaper wrappers. These patents are as follows:

Farquarharson, No. 217,685.
Dennis & York, No. 303,922.
Welsh, No. 236,387.
Bailey, No. 148,103.
Sill, No. 84223.
Zacharias, No. 67833.

It is needless to consider these patents separately, as they all show the same combination of parts and the same elements, but with differences of detail. Every one of the foregoing patents consists of a roll of paper having addresses upon it, feeding mechanism to feed the paper strip forward from the roll; mechanism for gumming the paper; a stamp moving vertically against a spring for the purpose of cutting off the strip and pressing it down upon the newspaper wrapper placed beneath it, and to which the label cut off was thus attached for the purpose of directing the same to the proper party. Incidentally the stamp or upper die, as Mr. Fowler calls it, was flat, and incidentally the table, or bed, on which the newspaper rested, or as Mr. Fowler improperly calls it, the lower die, was also flat. The machines would have been wholly useless without any other arrangement. Mr. Fowler nowhere contends (and in this he is right), that any of these patents by itself shows the invention of the Beach reissue, his contention being that any one who saw these patents and who wanted to stay a box corner could have altered the mechanism and substituted angular dies for flat ones, and could thus have made the Beach invention. It is clear that no one did this; it is clear that it would be a useless thing to do; and I think it is also clear that if it was done it would not make a practical device to stay box corners.

I will now refer briefly to the various patents which Mr. Fowler has set up in his deposition relating to the labeling art. Before doing this, however, I will say that these various patents are
227 all for labeling machines, or for machines for attaching stamps, and are what are known in the art as "labeling machines" or "stamp-attaching machines."

The Zacharias patent shows a machine for attaching labels to newspapers. A printed roll of labels containing the names and addresses of customers is to be fed from the machine, it is to be pasted, cut off, and by a flat presser be stuck onto the outside of the newspaper. As a matter of fact these machines have to be hand fed, because the distance between the names and the addresses of different customers is not always the same, and consequently the machine has to be manipulated by hand to avoid cutting through one of the labels. These machines are in common use in newspaper offices, and I have seen them in use in the office of the "Evening Post." The feed mechanism has been discarded, if ever one existed on the machine, and the operator fed the strip by his thumb. The strips containing the names and addresses are a little less than two feet in length, and cannot be made longer than an ordinary galley, because there is no machine in existence which would print a series of different names and addresses on a strip of indefinite length, and thus the lengths of the strips are limited to the length of a galley.

Mr. Fowler finds in the Zacharias patent all of the elements of the first three claims of Beach, although he says it has not Beach's dies, this being immaterial, he says, because the art shows such dies to be old. This may be true, but a person looking at the Zacharias patent would be no more led toward making a stay-strip machine than he would be led thereto by looking at any machine adapted for feeding and pasting a strip of paper and severing pieces therefrom. The idea of a stay-strip machine would not be conveyed thereby.

The same thing may be said of the Sill patent, No. 84223, and the Bailey patent, No. 148,103, the machines being substantially alike in function and operation, and adapted to do practically an impossible thing, to wit: feed out a lot of addresses on a strip of paper so that they can be cut off evenly and regularly, the addresses themselves being irregular and uneven.

In the same class can be put the Farquharson patent, No. 217,685, and the Welsh patent, No. 236,387. They all of them propose to feed address strips, gum them, cut them off from the strip and by flat surfaces press them onto a newspaper.

The Dennis & York patent, No. 303,922, is a good example of these machines where the strip is fed, pasted, cut and pressed
228 onto the wrapper of a newspaper, and that which I have said with regard to the other patents can be said with the same force and effect in regard to this patent.

I should have said before that the purpose of the Sill patent was not to attach addresses, but revenue stamps. These were sold in sheets, and, like the addresses, would have been in short strips.

All of these labeling or addressing machines show, it is true, a strip of paper, a pasting mechanism, some kind of a feeding mechanism, a cutting-off mechanism, and a device in the shape of a flat plate for pressing the address onto a newspaper or other article placed below the presser plate. All of the machines are hand machines, or foot-power machines, and in this regard would be useless for the purpose of applying stay strips to boxes.

In this connection, I might also say, that the feed mechanism of all such machines has to be hand-operated so as to get the labels properly cut from the strip, and the machines are comparatively slow and unsatisfactory in operation as far as rapidity is concerned; although they do contain some of the elements of the first three claims of the patent, I do not think that they would teach a mechanic anything whatsoever in the paper-box art. They are machines belonging to a different art; their purposes would be defeated if they had dies like those of Beach, and they would carry to no mechanic's mind the idea of a stay-strip machine.

Mr. Fowler summarizes and says that it was old to use diverging dies in old machines, and as it was old to paste strips on paper boxes, and as it was old to do that which the various patents hitherto referred to describe, that there was no invention in substituting in the labeling machines dies with diverging faces.

It cannot be contended that these labeling-machine patents do not contain parts which can be called by the same name as the parts of the Beach patent; that is, they have devices that can be called dies, and that press on a piece of paper. They have short strips of paper with the addresses, labels or stamps printed upon them, and they have cutting and gumming mechanism for these strips; and in the operation of the machines they cut pieces from these gummed strips, which pieces contain the address of the individual to whom the paper is to be sent; or, in the case of the Sill patent, they cut off a revenue stamp from a strip and cause it to adhere to the surface of any object to which it is to be applied.

There is, without doubt, a certain similarity to the mind of any one first looking at these labeling-machine patents and then con-
229 sidering the Beach reissue; and I have no doubt that some of the earlier machine patents could be taken, and by altering the dies, as Beach teaches us to do, that then in such a machine there might be set up a small box corner. But the point is that these labeling machines, although they are apparently similar to the Beach invention, existed, as the patents show, for many years before the date of the Beach invention, and as a matter of fact the Zacharias patents dates back to 1867, and no one was instructed by any one of these patents how to produce a machine for staying a box corner; and I do not think that a person today can contend that the Beach invention is met by a series of old patents describing mechanisms which were intended for doing other work in a different way, and which are not in their present form adapted for doing the work for which the Beach invention is intended, and which, even if altered as suggested by Mr. Fowler, would not satisfactorily perform the work of the Beach machine, or could ever be substituted in actual manufacture for that machine.

The Beach mechanism is in no sense a hand stamp, or device of that description, where the blow of the hand of the user pushes down a plunger and thus causes the adherence of a label to a newspaper. The only pressure necessary with a labeling machine is the same pressure that one applies to a postage stamp in sticking it upon a letter or the like. In the Beach machine there is neces-

sarily a heavy pressure brought to bear upon the stay strip, and the machine must be capable of exerting a sufficient pressure to make a satisfactory job with a stiff and unyielding stay strip. A mere blow of the hand would not, in general commercial use, be sufficient to cause the stay strip to be attached properly to a box corner. Likewise, in the labeling machines, the feed is usually uneven and generally has to be conducted by hand, and not by mechanical means, which would be another reason why the machines do not show the combinations of Beach. Of course, after an inventor has made an invention it is easy enough for every mechanic to see how he could have taken some old mechanism in the art, which had no relation to the invention under consideration, and by taking also some other old mechanism in the art he could have put these two things together and made the valuable invention which is in controversy. Practically, in every patent suit this is one of the defenses relied upon, and often it is correct; but I do not think that
230 in this case the contention can be successfully made, because the mechanism of the labeling and stamping art were not in themselves of such a nature as would have indicated to a mechanic examining them their adaptability for the box-stay-strip art; and that this is so, is proved by the fact that they existed almost twenty years before the date of the Beach invention, and no one thought that by so altering them a box-stay-strip machine could be made from them; and no one thought, nor dreamed, of doing such a thing until these old patents were raked up after Mr. Beach's invention had been make, and its value found out. Then the statement is made that they taught, in view of the state of the art, all that Beach taught. I say they did not. If they were evidently suitable for doing that which Beach described in his patent, then why was it that they were not utilized for that purpose?

It seems to me that when the matter is looked at in this way the difference between that which Beach taught and that which the addressing machines teach, can be clearly seen. Throughout the Beach patent the two right-angled dies are referred to in the claims and in the specification as "clamping dies;" that is to say, the dies co-operate to compress between them the corner of the box, with the stay strip pressed upon its exterior. Therefore, these dies have a co-operative relationship to the shape of the article acted upon, and they are adapted and arranged to operate on an article having such a shape, and there is necessarily a co-operative relationship between the upper and lower dies; one gives the pressure and the other receives it evenly and regularly at all points. Such are the dies, and such alone are the dies, which would be serviceable for the purpose of the Beach invention. In the old labeling machines, to which reference has been made so frequently by Mr. Fowler, this co-operative relation of the two services as shown in these devices does not really exist. It must be remembered that the plunger comes down, cuts off the address, or stamp, and then the parts are not clamped with a co-operative relationship as to shape in between the two dies; but, on the other hand, the plunger merely beds or sets the stamp on the rolled-up newspaper, the newspaper yielding to a

sufficient extent to allow the address to be stuck upon its wrapper; and the lower portion of the apparatus merely serves as a table to hold up, or support, the irregular mass of paper composing the bundle. The stamp is stuck onto the bundle as a boy would stick a stamp on any bundle—that is, with a sort of pat as it were.

231 No one can liken such an operation to the operation of clamping dies of the Beach patent, wherein two things are brought together, and are firmly and forcibly pressed between dies which shape and conform, as well as compress and support. The entire set of ideas in the two cases differ from each other; and the machines differ. The similarity is only apparent, and the more careful the examination the less relationship will there be found to be between the labeling machines and the Beach invention.

Int. 4. Have you examined that portion of Mr. Fowler's deposition which relates to "Defendants' Exhibit Knowlton Patent and File-wrapper;" and, if so, do you understand what is there referred to?

Ans. I have, and I understand Mr. Fowler's testimony on the subject.

Int. 5. Please state whether you agree with him in the conclusions he reaches?

Ans. I do not. Mr. Fowler was handed a file-wrapper of the Knowlton patent, which is a patent of a later date than the Beach patent, and Mr. Fowler states that in his opinion an examination of this file-wrapper supports his view that no invention was required to produce the Beach invention, in view of the state of the art, as shown by labeling, or stamp, or addressing machines, and his reasons are as follows: He finds that in the original Knowlton application the 15th claim was so broad, as the application was drawn, that the same was found to exist in the patent of Sill, number 84223; and he also finds that claim 6 contained in the amendment of November 12th, 1888, was also embodied, in his opinion, in the Sill patent; and he also states that these claims are, "when considered broadly," like claims 1, 2 and 3 of the patent in suit.

Turning to the file-wrapper, I find that the 15th claim is as follows:

"Fifteen. In a machine for the purpose stated a stationary anvil block, or die, an opposing movable die and a stationary knife, or cutter, acting in connection with the cutting edge upon the said movable die, substantially as described."

It will be seen that this claim does not include angular dies, and that the claim is not for the combination of opposing clamping dies having diverging faces, but was a claim for any clamping dies when a stationary knife or cutter, acted in connection with a cutting edge upon a movable die.

232 Clearly Knowlton was not entitled to this invention, and it should have been rejected on the Sill patent; and clearly this claim is not for the same combination as either the first, second or third claims when properly construed. The only way that Mr. Fowler can liken it to the claims of the patent in suit, is when he considers the Beach claims so broadly that he takes from

them that feature which gives them merit, value and novelty in the art.

Turning to the file-wrapper, I find in the amendment of November 12th, 1888, a sixth claim, as follows:

"Sixth. The combination, with an opposing clamping die, of means substantially as described acting upon the strip to advance the same towards the clamping dies, and means substantially as described for applying adhesive substance to the strip."

Of course, this claim, like the 15th, was too broad, in view of the state of the art, and could not be allowed. The claim includes clamping dies of all kinds, or any kind; and therefore was met, and rightfully met, by the earlier patents; and it will be observed that this claim, like the 15th, does not contain the combination of either the 1st, 2nd or 3rd claims of the Beach issue, because it does not contain a description of the only form of die with which the Beach invention can be carried out.

I do not think that Mr. Fowler's reference to the file-wrapper assists him very much in the view he has taken, because the only claims in the file-wrapper which are shown to be met by the earlier art, were claims which did not involve the essential and necessary form of dies, which are alone useful and serviceable with the Beach invention.

Int. 6. Do you agree with Mr. Fowler in his answer to the eighth interrogatory in his second deposition, that the patent in suit must be limited to the exact mechanism shown, and cannot, therefore, include the defendants' machine?

Ans. I do not agree with Mr. Fowler in this regard; and I clearly agree with the proposition that the defendants' machine is embraced within the terms of the claims here in controversy, namely: the first, second, third and sixth. I do not think that the state of the art either limits the Beach patent so that it cannot cover the defendants' machine, nor do I think that it leaves the Beach patent void for want of invention, as Mr. Fowler suggests.

Cross-examined by EDWARD S. BEACH, Esq., of counsel for the defendants:

Cross-int. 7. In view of the Farquharson, Dennis & York, Welch, Bailey and Sill patents, would there have been at the time
233 Beach filed his original application, any novelty in either of the following combinations:

"1. The combination with opposing clamping dies having flat working faces, of a feeding mechanism constructed to deliver stay strips between said clamping dies, and a pasting mechanism for rendering adhesive the stay strips, said clamping dies being constructed to co-operate in pressing upon interposed flat work the adhesive stay strips, substantially as described.

2. The combination, with opposing clamping dies having flat working faces, said clamping dies being arranged to co-operate in pressing adhesive fastening strips upon interposed flat work, a feeding mechanism constructed to feed forward a continuous fastening

strip, and a cutter for severing the said continuous strip into stay strips of suitable lengths, substantially as described.

3. The combination, with opposing clamping dies having flat working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon interposed flat work, a feeding mechanism constructed to feed between the dies a continuous fastening strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strips into stay strips of suitable lengths, substantially as described.

6. The combination of opposing clamping dies having flat working faces constructed to co-operate in pressing an adhesive stay strip upon interposed flat work, one of said clamping dies being constructed to act with an elastic or yielding pressure to enable the dies to operate upon work of different thicknesses, substantially as described."

You will observe that these combinations are identical with those of the first, second, third and sixth claims of the Beach reissue patent in suit, except that the dies have flat faces instead of diverging faces, and the work to be operated upon is flat instead of angular.

Ans. If I found these aggregations of words at the time Beach filed his original application, and if those words stood by themselves without any explanatory accompanying matter, I would be at a loss to know what they included or did not include. I would endeavor to find out whether a stay strip had ever been used to stay two things together where the work was presented flat. The claims would not inform me that they related to paper-box mechanism, and therefore I would have no guide as to what class of mechanism these aggregations of words were intended to cover. I would find

234 in examining some of the old patents, that there were like devices, or devices which might be called by the same names, and I would find in those devices or in some of them at least, the various parts which are referred to in the assumed claims of the question, and I would find that giving the broadest interpretation to the words of the assumed claims, that the part referred to in the claims had been brought together in mechanisms for attaching labels or the like. But I would not find that these machines were adapted, or were used, for pressing a stay strip or any stay or strengthening piece upon anything. I would find merely that the earlier mechanisms had been used to apply stamps and labels upon the outside of newspapers, or the like. And I would find that such machines were light, springy, yielding mechanisms, adapted for the exertion of such an amount of pressure as one would exert in sticking a stamp on an envelope, or the like. Therefore, finding the claims unaccompanied by any description, I would say, that broadly speaking, the combinations were new only to the extent that they operated on a stay strip in contradistinction to applying a postage stamp or label. If the claims were accompanied by drawings and a specification, such as are found in the Beach patent in suit, I would then say that the class of mechanism to which they related, was so distinct in its structure and so different in its operation from any-

thing that the old labeling machines show, that, although some of the old patents showed parts and combinations of parts to which the same names applied, that the devices themselves were radically different both in the necessities of their structure and in their capacities and capabilities for use, and I should be disposed to say, although the combinations included only flat dies, that in view of the distinction between the old and the new mechanisms, that the imaginary combinations presented novelty in view of the state of the art, and I would base my views in this regard on the fact that I could not find a single machine in the art which was adapted, with co-operating clamping dies, to press a flat stay strip onto anything whatsoever. I must add, in answering the question, although the question does not call for it, and it is perhaps volunteered on my part, that the case, as I understand it, does not present the question which is raised here, the patent being limited, as I understand it, to angular co-operating dies, adapted for operating on interposed box corners for applying stay strips thereto. If the claims were altered—I refer to the imaginary claims in the question—so
235 that they had the terminology of the Beach claim, I would then answer unqualifiedly that they presented novelty in view of the state of the art, and if I knew the art thoroughly, I would see that for the first time a machine had been produced which superseded hand work in an important operation necessary in the construction of rectangular boxes, and I would see that a pioneer invention had been made.

Cross-int. 8. Supposing Beach, in his original application, had described a square box, the four vertical sides of which (leaving the bottom out of consideration) had been made of one piece of paper, scored four times between its ends; that the ends had been brought together to form the four vertical sides of the square box, and that it had been desired to unite those opposed ends with the stay strip; and suppose, also, that with such a description in the specification, Mr. Beach had stated that the working faces of the dies might be flat and that he had shown flat-faced dies in his drawings, and that he had made the four claims set forth in the preceding interrogatory. Would those four combinations have been properly allowable in the Patent Office, in your opinion, without any modification?

Ans. I understand that the question assumes a box so bent that the material of the box has its ends abutting—say midway of one of the sides, and that the patent included such a box and described flat dies for applying the stay strip to hold the abutting ends of the flat side of the box together. These combinations, which are assumed, would, for the first time, have described any mechanism which was suitable or adapted for the application of stay strips of any kind to anything. I should have said, if the question had been presented to me, that there was some doubt whether these claims should be allowed, in view of the old addressing machines, but, on the other hand, when I came to find out the difference in the amount of power, and the difference in the character of the mechanism which is necessary in the application of a stay strip as distinguished from a stamp or label, I should have been disposed to allow

the claims if I had been an examiner, if they were strictly limited by the specification, to the application of stay strips in the paper-box art. I should have had some doubt as to my action, but I think that doubt would have been swept away by the consideration that Mr. Beach was the first person who ever applied a stay strip of any kind to anything by a mechanical means.

236 No such question is presented by the case here at issue, but in compliance with the question I have attempted to give the best answer I can to the assumed conditions.

I will add that the assumed conditions never exist, because paper boxes made in the way suggested are not provided with stay strips, the material is not abutted at the center of one of the sides, but the corner is lapped and glued and such boxes do not go on the staying machine at all, their corners being amply strong for all purposes.

Cross-int. 9. Are you able to state, of your own personal knowledge, that paper boxes made in the way suggested are not provided with the stay strips located as suggested?

Ans. I think I can. I have seen many thousands of boxes, and I have seen many boxes made by bending the sides from a strip of strawboard, and I never once saw a box so made with the strawboard abutted midway, or approximately midway on one of the sides, or where it abutted at all. I have always seen the strawboard in such a box lapped at the corner. It would be an insane thing to make it otherwise.

Cross-int. 10. Are you able to say, of your own personal knowledge, that the distance between the names and addresses of different customers on the strip used in newspaper-labeling machines is not always the same?

Ans. I have before me one of the strips printed by the Evening Post job-printing office, which is one of the largest offices in New York, and where the mail that is issued is enormous. I will give the distance between the different necessary cuts which the machine would have to make in severing the addresses apart, and I will state before I go further that the strip I now have before me was taken haphazard from a drawer full of such strips, and that I have seen many hundreds of like strips, and they all showed approximately the same difference. I will give the distances in sixteenths of an inch:

$\frac{8}{16}$ $\frac{10}{16}$ $\frac{5}{16}$ $\frac{10}{16}$ $\frac{7}{16}$ $\frac{13}{16}$ $\frac{5}{16}$

I have now given from the strip which contains about eighty different adresses the average measurements, or rather those measurements which show the general variation. I notice that there is one smaller than I measured, and one, if anything, larger. I think this conclusively shows that in practice the addresses vary. I cannot offer the strip in evidence because it discloses the circulation, or part of the circulation, of a certain journal, but I offer it to defendants' counsel for examination.

237 (The answer is objected to as irresponsive and volunteered, and counsel for defendant declines to examine the slip.)

Cross int. 11. What degree of angularity must there be in the working faces of the opposed clamping dies in a box-corner staying machine in order to embody the invention of the first, second, third, and sixth claims of the reissue letters patent in suit?

Ans. Each one of the claims refers in terms to an interposed box corner. The corners of boxes which are stayed by such a machine are, I may say, invariably right-angle corners; and so far as practice goes, no other corner need be considered, and the patent may be read as descriptive of right-angled dies. The infringement is a right-angled die, and the whole discussion is limited to right-angled dies. The patent describes no other form of dies, and no other form would be salable on the market, because boxes having other than right-angled corners are seldom made, and so far as my experience goes, if they were made they would be made without stay strips. If the question inquires as a matter of curiosity how the dies might be varied, and still come within the claims, I will answer it with pleasure by saying, that so long as the angle of the dies is adapted to act upon an ordinary box corner of that character of box where stay strips are used, I think that such machines would be covered by the patent. I think Mr. Beach might make a die for a six-sided box, or he might make one for an eight-sided box. I name these two figures because I have seen six and eight sided boxes, though they did not have stay strips. I do not know how far beyond this the departure might go. The patent as it stands distinguishes against flat dies and includes only dies suitable for box corners. If the dies were flat or substantially flat in a machine, the machine could not be held under the patent. This is the best answer I can make, because the question goes outside of the domain of the patent as it stands, and outside of any question of infringement which this case has raised.

Cross-int. 12. Suppose it were desired to make a four-sided box of the character hereinbefore considered by you, out of very light stuff, such for example, as writing paper of good thickness and quality; that the opposed ends of the piece forming the four sides of the box were to be united by a light-weight stay strip; would it not be perfectly practical to apply the stay strip in that case upon the addressing and labeling machines described in the prior patents to which your attention has been called?

Ans. I will look. I will take the machines in order, and
238 I will state before beginning my answer that I understand the box described to be the one with abutting edges midway of one of its sides.

The Farquharson patent: No stay strip could be applied by this patent to the box suggested, unless the box could be slipped over the base of the machine and the table on which it stood and then to get on anything upon the box, the machine would have to be supported by its rear end in some way not shown or described, so that the box could be gotten over the table and the base of the machine, and then the only strip which could be applied would be a long narrow one, its greatest dimension running across the abutting edges of the supposed box. I think it may be said that it would

be impossible to practically stay such a box on the Farquharson machine.

In the Dennis & York patent, the lower portion that receives the paper is arranged to be moved downward and upward within a receptacle. No box could be stayed on that machine, because of the presence of the apparatus adapted for the movement of this part. The box could not be gotten over the lower portion of the machine without cutting the mechanism away.

In the Welch patent no box could be gotten over the lower dies or support, unless it were a very large box, and unless the parts were altered in their operation so that the table X was held stationary, was reduced in diameter, or width rather.

As to the Bailey patent, the box could not be gotten under the strip in such a way as to attach the strip to the box without a change in the cutting mechanism.

In the Sill patent the operator might have a better chance if his box were big enough to go over the table A. In this event a narrow strip might be applied, but to do this the machine would have to be supported so that the table A projected, which is a thing never contemplated in the Sill patent.

In the Zacharias patent the ordinary table in a room forms the lower support, and of course the box could not be passed over the end of an ordinary table.

This includes all of the labeling machines. None of them, as they stand, are adapted for putting on a flat stay strip on the flat side of a paper box, except under certain abnormal conditions.

Cross-int. 13 What are these abnormal conditions?

Ans. Either an enormous box, a cutting away of some portion of the mechanism, or the providing of new lower supports
239 for the article. And when all this was done nothing could be gotten out of the imaginary box but a narrow long strip with its greatest dimension in the wrong direction, to wit, at right angles to the abutting edges of the box.

Cross-int. 14. I call your attention to lines 125, 134, page 2, lines 1 to 8, page 3, of the patent in suit. Do you find in the defendants' machine the cutting device and means for actuating the same which are described in these lines?

Ans. I have not the machine before me, and I have not seen it for eighteen months, but as I recall it, one end of the upper die acted as a shear blade in connection with the stationary opposing edge and the stay strip which was bent parallel with the box corner and not at right angles thereto, was cut off between the shearing edges of the die and the stationary portion. I do not find in the defendants' machine the particular construction of shear which I find in the Beach reissue at the portion quoted, but I do find in the machine two like co-operating shearing edges which, so far as the strip is concerned, perform upon it the same work which is performed by the mechanism described in the patent. I consider them equivalent.

(All after " portion quoted " objected to as volunteered.)

Cross-int. 15. Do you find in defendants' machine a feed-roller in connection with an elastic bed and other parts set forth in lines 113-125, page 2 of the patent in suit?

Ans. The defendants' machine, as I recall it, did not have the particular form of feed of the patent, and in place of the roller and bed it had a reciprocating portion, with a device on its front adapted to first make pressure on the strip and then carry the strip forward. The device, after feeding the strip, would return to its original position, so as to get a fresh grip for the next feed movement. I regard it as an equivalent of the feed of the patent.

(All after "feed movement" objected to as volunteered.)

HENRY L. BREVOORT.

240 UNITED STATES OF AMERICA, *Southern District of New York*, } ss:

Circuit Court United States, District of Massachusetts. In Equity.

FRED H. BEACH
v.
HOBBS MFG. CO. ET AL.

I, John A. Shields, a commissioner duly appointed by the circuit court of the United States for the southern district of New York, and special examiner in the above-entitled cause, do hereby certify that on the days indicated in foregoing testimony I was attended by John Dane, Jr., Esq., of counsel for complainant and by Edward S. Beach and J. E. Maynadier, Esq's, of counsel for defendants, and by the witnesses, Henry L. Breevort, Fred H. Beach, Ebenezer Spooner, J. D. Otis, and Charles B. Baldwin; that the said witnesses were by me carefully examined and cautioned and sworn to testify the truth, the whole truth, and nothing but the truth in the above-entitled cause, and thereupon gave their depositions, which were taken down by a typewriter appointed by me for that purpose, in the presence of the witnesses, and from their statements, and after carefully reading the same, the said witnesses severally subscribed their said depositions.

I further certify, that notifications of the time and place of taking said depositions, signed by John Dane, Jr., solicitor for complainant, *was* made out and served on Messrs. Maynadier & Beach, to be present at the taking of said depositions, said notices being hereunto annexed.

And I do further certify, that I am not of counsel nor attorney for either of the parties in the said depositions and caption named, nor in any way interested in the event of the cause named in said caption.

In testimony whereof, I have hereunto set my hand and seal this 13th day of June, in the year of our Lord one thousand eight hun-

dred and ninety-four, and of the Independence of the United States the one hundred and eighteenth.

JOHN A. SHIELDS,
United States Commissioner, Duly Appointed by the Circuit Court of the United States for the Southern District of New York, in the Second Circuit, and Special Examiner.

241 EXHIBITS.

DEFENDANTS' EXHIBIT CERTIFIED COPY FILE-WRAPPER AND CONTENTS BEACH'S ORIGINAL PATENT, No. 447,225. L. W. H., Sp'l Ex'r.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the file-wrapper and contents, in the matter of the letters patent granted Fred H. Beach, February 24, 1891, number 447,225, for improvement in machine for attaching stays to the corners of boxes.

In testimony whereof I, N. L. Frothingham, acting Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 22d day of November, in the year of our Lord one thousand eight hundred and ninety-two, and of the Independence of the United States the one hundred and seventeenth.

[SEAL.] N. L. FROTHINGHAM,
Acting Commissioner.

Petition and Power of Attorney.

To the Commissioner of Patents:

Your petitioner, Fred H. Beach, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, prays that letters patent may be granted him for the improvement in machines for attaching stays to boxes set forth in the annexed specification.

And he hereby appoints R. F. Osgood, of Rochester, N. Y., his attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

FRED H. BEACH.

Dated at Rochester, June 4th, 1885.

242 To all whom it may concern:

Erase & insert sub. spec.

Be it known that I, Fred H. Beach, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful improvement in machines for attaching stays to the corners of boxes; and I do hereby declare that the following is a full, clear and exact description of the same, reference being had to the accompanying drawings, in which

Fig. 1 is a side elevation of a machine showing my improvement.

Fig. 2 is a front elevation of same, at right angles to Fig. 1, looking in the direction of the arrow, Fig. 1.

Fig. 3 is a vertical cross-section in line, *x x*, of Fig. 2.

Fig. 4 is a perspective view of the lower ends of the two plungers separated.

Fig. 5 is a similar view looking on the back side, and showing the parts fitted together.

Fig. 6 is a perspective view of the front end of the follower for turning the stay under the corner of the box.

Fig. 7 is a side view of the shears.

Per A.

in sections

Figs. 8 and 9 are diagrams A illustrating the process of applying the stay to the corner of a box.

Insert C'.>

Fig. 10 is an edge view of one corner of the completed box.

It is customary in making paper boxes to apply a strip over the corners which is pasted down on each side [and the overlapped end is turned under the under side.]* Such work, so far as I am aware, has heretofore been done by hand. My improvement consists of a machine to do the work, constructed, arranged and operated as hereinafter described.

Erased per A.

In the drawings, A shows the frame, which may be of any suitable form, B is a block of triangular or square shape, set up cornerwise and attached to the front side of the frame, constituting a form over which the corner of the box is fitted to apply the stay. In the top

[Matter enclosed between rules erased in copy.
[* Words and figures enclosed in brackets erased in copy.]

of the block is made a square notch, *a*, to allow the follower to pass, as will presently be described.

C is a shaft in the top of the frame, provided with two cam wheels D, E. G is a plunger resting vertically in ways *b b*, and moving freely up and down. It has a roller or stud, *c*, which rests in a cam groove, *d*, of the cam wheel, D, by which it is operated, and in its lower end is a square notch, *a'*, which coincides with the notch *a*, in the form B, the two, when fitted together forming a perfect square.

Per A. 243 The plunger G is made in two parts A G G' sliding one over or within the other, with a rubber or other spring, *z*, between, by which means the lower end will have a degree of elasticity and will yield to a certain extent when brought down on the box, thus preventing shock, also rendering it adjustable to different thicknesses of the sides of the box. H is a secondary plunger resting in a groove of the back of main plunger, G, (Figs. 4 and 5) and having in its lower end a square notch, a^2, similar to the others. The secondary plunger, H, is forced down by a cam rim *f*, on cam D, which strikes a shoulder, *g*, on the plunger, and it is reacted or drawn up by a coiled spring, *h*, resting in a groove of the secondary plunger, the lower end being attached to the secondary plunger—the upper end being attached to a pin projecting from the main

Per A. plunger. I is a horizontal [shaft]* A follower of square form in cross section, resting in line with the notch, *a*, and extending horizontally through bearings in the frame, and provided at its rear end with a stud, *i*, which rests in a cam groove, *j*, in the cam wheel, E. by which it receives motion forward and back.

J is a paste-well on one side of the machine, and K is a reel on which is wound the strip of paper or other fabric from which the stays are cut. C is a pasting roller over which the strip passes. L is an elastic bed, and *k*, *l*, are pressure rollers on opposite sides of the bed, above and

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

below. The upper roller is preferably corrugated or roughened, and serves as a feed-roller to feed the strip over the bed, and it is operated by a segment gear, *r*, on cam E. which engages with a cog wheel, *s*, on the shaft of roller *k*. *m* is a stationary plate on one side of the bed, forming a shear, and *n* is a vibrating cutter pivoted thereto, (Fig. 7) and also pivoted at the rear end to a slide, *o*, which has a stud, *p*, that rests in a cam groove, *q*, of the cam wheel E, by which the cutter is operated to cut off the stay.

The machine may be driven by any suitable means, that shown in the drawings being a band wheel, M, running loosely on the shaft, C, and being made to engage therewith by means of a clutch, *t*, connected with a treadle, *u*, at the bottom of the machine.

The operation is as follows:

The strip of paper or other fabric from the reel, *k*, is fed along, being gummed on its passage over roller O, and is cut off into strips by the shears, *n*, as fast as wanted. The corner of the box or cover, R, is placed over the triangular form, B, directly above the notch, *a*, therein, and below the plunger, G, H, at the same time the follower, I, is projected outward filling the notches *a*, *a*, and serving as a foundation for the plungers to act on. Then the plunger, G, comes down and presses the cut strip over the corner of the box, lapping on each side. The strip is made of such width that when pasted down, as described, a loose end projects outward over the inner edge of the box. The secondary plunger, H, then comes down and turns this loose end down vertically, as shown in Fig. 8. Then the secondary plunger moves up out of the way, and at the same moment the follower, I, which has before been withdrawn from the notch, moves forward again and presses the projecting edge of the stay into the angle under the box, as shown in Fig. 9.. By the means above described the work is done rapidly and in a very perfect manner.

244

Substitute A′.

In some kinds of work the stay can be ap-

[Matter enclosed between rules erased in copy.]

plied and the projecting edge turned under without the use of the secondary plunger, H; but in ordinary work it is necessary.

Having described my invention, what I claim as new and desire to secure by letters patent, is—

1st. In a machine for attaching stays to boxes, the combination of a form on which the corner of the box is placed, a plunger which comes down to press the stay upon the box, a secondary plunger which comes down to turn the projecting end of the stay down at right angles, and a follower which moves inward to carry the projecting end under the edge of the box, as set forth.

2d. In a machine for attaching stays to boxes, the combination of a form on which the corner of the box is placed, a plunger which comes down to press the stay upon the box, a secondary plunger which comes down to turn the projecting end of the stay down at right angles, a follower which moves inward to carry the projecting end under the box, and a paste-tank, reel, and shears, as shown and described and for the purpose specified.

3d. In a machine for attaching stays to boxes, the combination of a form upon which the box is placed, a plunger which comes down to paste the stay upon the top of the box, and a follower which moves inward to turn the projecting end of the stay under the box and paste it on the under side, as set forth.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRED H. BEACH.

Witnesses:
R. F. OSGOOD.
E. STARING.

245 *Oath.*

STATE OF NEW YORK, } ss:
County of Monroe, }

Fred H. Beach, the above-named petitioner, being duly sworn, deposes and says that he is a citizen of the United States and a resident of Rochester, in the county of Monroe and State of New

Matter enclosed between rules erased in copy.]

York; that he verily believes himself to be the original and first and sole inventor of the improvement in machines for attaching stays to boxes described and claimed in the foregoing specification; that the same has not been patented to him or to others with his knowledge or consent in any country; that the same has not to his knowledge been in public use or on sale in the United States for more than two years prior to this application; and that he does not know and does not believe that the same was ever known or used prior to his invention thereof.

FRED H. BEACH.

Sworn to and subscribed before me this 4th day of June, 1885.

E. STARING,
Com. of Deeds.

(Enclosed:) United States Patent Office, Jun- 10, 1885. Serial No., 168,218; paper No. 1. Appl'n. Filed June 10, 1885.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Aug.* 20, 1885.
Mailed Aug. 20, 1885.

Machine for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care R. F. Osgood, Rochester, N. Y.:

This application has been examined.

The plunger G divided into two parts with a rubber spring *z* between them, as described at the top of page 3, is not shown in Figs. 3 and 5, and is not lettered in any of the figures. The pin marked *q* in Fig. 7 should be marked *p*. "Shaft" line 16, page 3, should be "follower." The cog wheel *s* referred to in line 3, page 4, is not lettered in the drawings. It is not stated how the stay can be applied and the projecting edge turned over without the use of plunger H, and claim 3 cannot be allowed until this is done.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 1. Letter, dated Aug. 20, 1885.

246 168,218.

F. H. Beach. Machine for attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patents:

I amend as follows:

Insert words "*in sections*" after word "*diagrams*" 2nd line from bottom in page 1.

Erase *all* between word "*side*," line *6*, page *2*, and the word "*such*," line *7*, same page.

Insert after words "*parts*" the letters "*G, G,*" in the *last* line of page *2*.

Substitute word "*follower*" for "*shaft*," line *16*, page *3*.

Erase the *remainder* of the *specification* after word "*manner*," line *9*, page *5*, including the claims, and substitute the following:

A'. Erase per sub. spec.

In some cases, with the use of thin stays, the edge that projects beyond the edge of the box will be turned down sufficiently by the action of the plunger G, and without the use of the secondary plunger, H, to enable the follower, I, to catch it and turn it under the edge of the box; but in ordinary work, where said edge is to be turned down and carried under the edge of the box, the follower is necessary. In many boxes the stay is simply pasted down over the corner of the box and is not turned under, in which case the work can be done by using the angular form and one plunger with a corresponding angular notch.

Having described my invention I claim—

Erase & insert B'.

1st. In a machine for attaching stays to boxes, the combination of a form of angular shape presenting a corner to receive the corner of the box and a plunger provided with a corresponding angular notch which fits the form and pastes the stay to both angular sides of the box and over its apex, as described.

Erase per sub. spec.

2d. In a machine for attaching stays to boxes, the combination of a form of angular shape presenting a corner to receive the corner of the box, a plunger provided with a corresponding angular notch which fits the form and pastes the stay down on the angular sides of the box, a secondary plunger which comes down and turns the projecting end of the stay down at right angles, and a follower which turns the projecting end of the stay in at right angles and pastes it to the inside of the box, as set forth.

3d. In a machine for attaching stays to boxes, the combination of an angular form on which the box is placed, a plunger which
247 comes down to press the stay on the box, a secondary plunger, which comes

[Matter enclosed between rules erased in copy.]

down to turn the end of the stay at right angles, a follower that moves in to turn the projecting end of the stay under the box, and a paste-tank, reel and shears for pasting the stays, passing them to the box and cutting them off, as described.

Erase & insert B².

4th. In a machine for attaching stays to boxes the combination with an angular form on which the corner of the box is placed of a plunger with an angular notch to fit the form, said plunger being formed with an elastic or yielding foot, which will yield when pressed upon the form, as set forth.

5th. The combination, with the angular form having a notch in its top, and with the plunger having a notch to fit the form, of a [plunger]* follower which, when moved out into the notch of the form, completes the square of the form and furnishes the support upon which the corner of the box receives the pressure in pasting, as set forth.

Erase per sub. spec. per B.

Respectfully submitted.

FRED H. BEACH,
Per R. L. OSGOOD, *Attorney.*

(Endorsed:) United States Patent Office, May 4, 1886. Serial No., 168,218; paper No. 2. Amendment A. Filed May 4, 1886.

In view of the above, further action requested. New drawing is forwarded to take place of sheet 2.

Respectfully, R. F. OSGOOD, *Attorney.*

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Sept.* 3, 1886.
Mailed Sept. 4, 1886.

Machines for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

This application, as amended, has been considered. Cog wheel *s* is not lettered and roller *k* should appear in Fig. 1.

Claim 1 should include means for applying paste to the stay. As at present stated it is met by J. Cohn, 148,416, March 10, 1874, box machines, and is rejected.

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

248 The term "foot" 1, 9 of claim 4 is not found in the description.

In claim 5 "plunger" line 5 should be "follower," the term used in the description.

G. A. NIXON,
Ass't Examiner in Charge.

(Endorsed:) Serial No., 168,218; paper No. 3. Rejection, dated Sep. 3, 1886.

168,218.

F. H. Beach. Machine for attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patents:

I AMEND as follows:

Add the reference letter "*s*" to the cog wheel in the drawings.

Erase *claims 1 and 4* and substitute the following:

[B'.]*

Erase & insert E' per C.

"1st. In a machine for attaching stays to boxes, the combination of a form of angular shape to receive the corner of the box, a plunger provided with a corresponding angular notch, which fits the form to paste the stay to both substantially as described sides of the box, and a pasting apparatus A that pastes one side of the stay before it reaches the form, as set forth."

[B².]*

Erase & insert D.

"4th. In a machine for attaching stays to boxes, the combination of a form of angular shape presenting a corner to receive the corner of the box, and a plunger provided with a corresponding angular notch to fit the form, said plunger constructed with an elastic lower end which will yield when pressed upon the form, as and for the purpose specified."

Erase word "*plunger*" and substitute word "*follower*" in line 5, claim 5.

Respectfully submitted.

FRED H. BEACH,
Per R. F. OSGOOD, *Attorney.*

(Endorsed:) U. S. Patent Office, division XVII, Nov. 10, 1886. Serial No., 168,218; paper No. 4. Amend't B. Filed Nov. 10, 1886.

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Nov.* 16, 1886.
Mailed Nov. 17, 1886.

Machine for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

This application as amended, has been considered.

Reel K is not shown in Fig. 1. The reel should either be
249 shown in that Fig., or it should be stated in the description that it is omitted, and in that case, its supports only need be shown. If the reel K is omitted, the roller *k* should be shown.

A new figure has been added to sheet 1, which is neither marked nor described.

"Apparatus" 1, 9 of claim 1 should be qualified by some such expression as "substantially as described."

Claim 4, covering, as it does, subject-matter not embraced in the statement of invention or the claims as originally presented, cannot be considered until the supplemental oath required by rule 47 of the rules of practice has been filed.

L. M. E. COOKE, *Examiner.*

G. A. NIXON, *Ass't Examiner.*

(Endorsed:) Serial No., 168,218; paper No. 5. Letter, dated Nov. 16, 1886.

168,218.

F. H. Beach. Attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patents.

SIR: In response to official letter of the 16th, I would say that I ordered in previous communication that the figure I sent should be shown as an addition to Fig. 1, instead of being made a new figure; but as it has been added as a new figure, you will please add the reel to Fig. 1 and charge my account.

I inclose herewith an amendment drawn in accordance with the official requirements. I will also inclose the supplemental oath required. Further action requested.

Respectfully,

R. F. OSGOOD,
Attorney for F. H. Beach.

(Endorsed:) U. S. Patent Office, Nov. 23, 1886.

168,218.

F. H. Beach. Stay for boxes.

Filed June 10, 1885.

COUNTY OF MONROE, } ss:
State of New York, }

Fred H. Beach, whose application for letters patent for an improvement in attaching stays to boxes, (serial number 168,218,) was filed in the United States Patent Office June 10th, 1885, being duly sworn, deposes and says that he verily believes himself to be the original and first inventor of the improvement described and claimed in the amended fourth claim now pending in said application, in addition to that which was embraced in the claims
250 originally made, and that he does not know and does not believe that the same was ever before known or used, and that the matter sought to be inserted formed a part of the original invention at the date of filing the application.

FRED H. BEACH.

Sworn to and subscribed before me this 20th day of November, A. D. 1886.

POMEROY P. DICKINSON,
[L. S.] *Notary Public.*

(Endorsed:) U. S. Patent Office, Nov. 23, 1886.

168,218.

F. H. Beach. Attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patents:

I AMEND as follows:

Insert after line *3, p. 2*, the following:

C'. "Fig. 11 is an end elevation of the pasting tank and reel with connecting parts."

Add the necessary letters and markings to Fig. 11 of the drawings.

Insert after word "apparatus" the words, "substantially as described," line 9, of claim 1.

Respectfully submitted.

FRED H. BEACH,
Per R F. OSGOOD, *Attorney.*

(Endorsed:) U. S. Patent Office, Nov. 23, 1886. Serial No., 168.218; paper No. 6. Sup. oath & amend't C. Filed Nov. 23, 1886.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Dec.* 3, 1886.
Mailed Dec. 3, 1886.

Machine for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

The supplemental oath filed in this case is not in accordance with rule 47, which directs that the supplemental oath be attached to the proposed amendment. Applicant should rewrite the claim and attach it to the proper supplemental oath and erase by amendment the claim now on file.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 7. Letter, dated Dec. 3, 1886.

251 168,218.

Fred H. Beach. Stay for boxes.

Filed June 10, 1885.

To the Commissioner of Patents:

I amend by erasing the pending 4th claim and substituting the following:

D. Erase per sub. spec.

"4th. In a machine for attaching stays to boxes, the combination of a form of angular shape, presenting a corner to receive the corner of the box, and a plunger provided with a corresponding angular notch to fit the form, said plunger constructed with an elastic lower end which will yield when pressed upon the form, as and for the purpose specified."

Respectfully submitted.

FRED H. BEACH,
Per R. F. OSGOOD, *Attorney.*

Further action requested.
R. F. OSGOOD, *Att'y.*

CITY OF ROCHESTER,
County of Monroe, State of New York, } ss:

Fred H. Beach, whose application for letters patent for an improvement in attaching stays to boxes (serial No., 168,218), was filed

[Matter enclosed between rules erased in copy.]

in the United States Patent Office on or about the 10th day of June, 1885, being duly sworn, deposes and says that he verily believes himself to be the original and first inventor of the improvement as described and claimed in the foregoing amendment, in addition to that which was embraced in the claims originally made; and that he does not know and does not believe that the same was ever before known or used, and that the matter sought to be inserted formed a part of his original invention at the date of filing said application.

FRED H. BEACH.

Sworn to and subscribed before me this 8th day of December, 1886.

[L. S.] WM. J. McPHERSON,
Notary Public in and for Monroe Co., N. Y.

(Endorsed:) U. S. Patent Office, Dec. 10, 1886. Serial No., 168,218. Amend't D. Filed Dec. 10, 1886.

252 DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Dec.* 24, 1886.
Mailed Dec. 24, 1886.

Machine for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

Further action on this case must be postponed until another pending application with which it will probably interfere, has been put in proper condition for said interference.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 9. Letter, dated Dec. 24, 1886.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Jan.* 28, 1887.
Mailed Jan. 29, 1887.

Machine for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

On reconsideration of this case, it is found that the combination in claim 1 is incomplete. To complete the combination and make it operative, it should include as elements "the feeding mechanism substantially as described," and "the cutting mechanism substantially as described." The claim as it now stands is rejected.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 10. Rej., dated Jan. 28, 1887.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 23, 1887.
Mailed Feb. 24, 1887.

Machine for attaching stays to the corners of boxes. Serial No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

Applicant is required to amend within ten days on account of probable interference.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 11. Letter, dated Feb. 23, 1887.

253 168,218.

F. H. Beach. Machine for attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patents:

I amend by erasing claim 1 and substituting the following:

Erased per sub. spec. E'.

"1st. In a machine for attaching stays to boxes, the combination of a form of angular shape to receive the corner of the box, a plunger provided with a corresponding angular notch which fits the form to paste the stay to both sides of the box, a feeding mechanism to feed the strip along, a cutting mechanism to cut the strip, and a pasting mechanism to paste one side of the strip before it reaches the form, said mechanisms being substantially as described, and the whole operating in the manner and for the purpose specified."

Resp'y submitted.

FRED H. BEACH,
Per R. F. OSGOOD, *Att'y.*

(Endorsed:) United States Patent Office, Mar. 5, 1887.

168,218.

F. H. Beach. Machine for attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patent.

SIR: I enclose amendment in above-named case and request further action.

Respectfully, R. F. OSGOOD,
Attorney for Fred H. Beach.

(Endorsed:) United States Patent Office, Mar. 5, 1887. Serial No., 168,218; paper No. 12. Amendment E and letter from att'y. Filed Mar. 5, 1887.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *March* 7, 1887.

Fred H. Beach, care R. F. Osgood, Rochester, N. Y.:

Please find below a copy of a communication from the examiner concerning your application for an improvement in machines for attaching stays to the corners of boxes—serial No., 168,218—filed June 10, 1885.

Very respectfully, M. V. MONTGOMURY,
Commissioner of Patents.

254 Room No. 215.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the rules.

The statement demanded by rule 105 must be sealed up and filed on or before the 30th day of March, 1887, with the subject of the invention and name of party filing it indorsed on the envelope. The subject-matter involved in the interference is:

In a machine for applying stay pieces to the corners of paper boxes, the combination of a rest or support for the corner of the box, a feeding device substantially as described to project the end of a continuous strip of paper or cloth over the corner of the box on said rest, cutting mechanism substantially as described for severing a stay piece from the end of said strip of paper or cloth, means substantially as described for applying an adhesive substance to the strip or stay piece, and a plunger for pressing the severed stay piece onto the corner of the box, substantially as set forth.

The subject-matter of interference is covered substantially by your first claim and by the first and second claims in the pending

application of Jas. C. Marshall of Rochester, N. Y., whose attorneys of record are A. H. Evans & Co., Washington, D. C.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 13. Intf., dated March 7, 1887.

Issue division. Serial No., 168,218.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,
U. S. PATENT OFFICE,
WASHINGTON, D. C., *April* 28, 1887.

Fred H. Beach, care of B. F. Osgood, Rochester, N. Y.

SIR: Your APPLICATION for a patent for an IMPROVEMENT IN MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES, filed June 10, 1885, has been examined and allowed.

The final fee, TWENTY DOLLARS, must be paid, and the letters patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

255 If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of specifications and drawings will be charged for at the following rates: Single copies, uncertified, 10 CENTS EACH. The money should accompany the order.

Very respectfully, BENTON J. HALL,
Commissioner of Patents.

☞ In remitting the final fee give the serial number at the head of this notice.

The within title is that given by the examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons MUST be given therefor on or before the payment of the final fee.

49 ARCADE, ROCHESTER, N. Y., *Sept.* 26, 1887.

SIR: I enclose check, $50, to apply as follows on patent fees:

1. John Maggs' musical transposition indicator serial No. 162,885 final fee $20
2. Fred H. Beach machine for attaching stays to the corner of boxes serial No., 168,218, final fee 20
3. To apply on my personal account with office 10

$50

256 In regard to Maggs' case above the title as sent me in notice of allowance was musical "transportation" indicator. It should be musical "transposition" indicator.

Respectfully, R. F. OSGOOD.

Hon. Com'r of Patents.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Sept.* 27, 1887.

To the Hon. Commissioner of Patents:

It is respectfully requested that the application of Fred H. Beach, Ser. No., 168,218, filed June 10, 1885, for imp'ts in machines for attaching stays to the corners of boxes, allowed Apr. 26, 1887, be withdrawn from issue on account of probable interference with another application. The final fee has not been paid.

L. M. E. COOKE, *Examiner.*

Approved.
R. B. VANCE,
Acting Commissioner.

Case withdrawn from files of Issue and Gazette division Sept. 27, 1887.

T. W. D. B.

(Endorsed:) Serial No., 168,218; paper No. 16. Withdrawn fr. issue, dated Sept. 27, 1887.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Sept.* 27, 1887.
Mailed Sept. 28, 1887.

Machine for attaching stays to the corners of boxes. Ser. No., 168,218. Filed June 10, 1885.

Fred H. Beach, care R. F. Osgood, Rochester, N. Y.:

This application has been withdrawn from issue on account of probable interference with another application. Further action must be postponed until said application has been put in proper condition for said interference.

L. M. E. COOKE, *Examiner.*

GEO. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 17. Letter, dated Sept. 27, 1887.

257 *Memorandum of Fee Paid at U. S. Patent Office.*

Serial No., 168,218. 1885.

Inventor:
Fred H. Beach.

Patent to be issued to—
Fred H. Beach.

Name of invention as allowed:
Machine for attaching stays to the corner of boxes.

Date of payment:
—— ——.

Fee:
Twenty dollars.

Date of filing:
June 10, 1885.

Date of circular of allowance:
April 28, 1887.

R. F. OSGOOD, *Attorney.*

Send patent to—
R. F. Osgood, Rochester, N. Y.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Dec.* 27, 1887.

Fred H. Beach, care R. F. Osgood, Rochester, N. Y.:

Please find below a copy of a communication from the examiner concerning your application for letters patent for improvements in

machines for attaching stays to the corners of boxes, serial No. 168,218. Filed June 10, 1885.

Very respectfully, BENTON J. HALL,
Commissioner of Patents.

Room No. 215.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the rules.

The statement demanded by rule 105 must be sealed up and filed on or before the 27th day of January, 1888, with the subject of the invention and name of party filing it indorsed on the envelope.

The subjects-matter involved in the interference are:

258 1. The combination with a die having diverging cheeks of a punch having diverging faces corresponding to the die, said punch and die co-operating to lay the adhesive fastening strip upon the corner of an interposed box, a feeding device substantially as described, for feeding the strip directly between the die and punch, and a cutter for severing the strip into suitable lengths, substantially as described.

2. The combination with a die adapted to receive a box corner, a punch corresponding to the die, said die and punch co operating to lay the fastening strip upon the corner of an interposed box, a feeding device substantially as described, for feeding the strip directly between the punch and die, a cutter for severing the strip into suitable lengths, and a strip turner and folder located in proximity to the die for engaging with and laying the overlapping end of the fastening strip in the interior of the corner of the box, substantially as shown and described.

The first of these subjects-matter of interference involves your first claim and the first and eighth claims in the pending application of Gustave L. Jaeger, of New York, N. Y., whose attorneys of record are Van Santvoord & Hauff of Washington, D. C.

The second of these subjects-matter of interference involves your second and third claims and the second and seventh claims of said Jaeger.

L. M. E. COOKE, *Examiner.*

(Endorsed:) Serial No., 168,218; paper No. 18. Intf. with app of Jaeger, dated Dec. 27, 1887.

DEPARTMENT OF THE INTERIOR.
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Dec.* 1, 1888.
Mailed " 3, 1888.

Machine for attaching stays to the corners of boxes. Ser. No., 168,218. Filed June 10, 1885.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

On account of probable interference with other pending applications, further action on this application must be postponed until said application can be put into proper condition for said interference.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 21. Letter, dated Dec. 1, 1888.

259

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 15, 1889.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

Please find below a copy of a communication from the examiner concerning your application for letters patent for improvements in machines for attaching stays to the corners of boxes, filed June 10, 1885; Ser. No., 168,218.

Very respectfully, BENTON J. HALL,
Commissioner of Patents.

Room No. 215.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the rules.

The statement demanded by rule 105 must be sealed up and filed on or before the 18th day of March, 1889, with the subject of the invention, and name of party filing it, indorsed on the envelope. The subject-matter involved in the interference is:

The combination with a die or form having diverging cheeks, of a punch or plunger having diverging faces corresponding to the die, said punch and die co-operating to lay an adhesive fastening strip upon the corner of an interposed box, a feeding device, substantially as described, for feeding the strip directly between the die and punch, and a cutter for severing the strip into suitable lengths, substantially as described.

This subject-matter of interference is the second claim in the pending application of Horace Inman, of Amsterdam, N. Y., whose attorneys are Van Santvoord & Hauff of Washington, D. C., and

substantially includes the first, fourth, fifth and sixth claims of said Inman's application, the claim in the pending application of David Rice of Amsterdam, N. Y., whose attorney is Alex. P. Browne of 82 Water street, Boston, Mass., the first claim in the pending application of Mark D. Knowlton of Chicago, Ill., whose attorney is Frankland Jannus of Washington, D. C., and the first claim of your application.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper 22. Int. Inman, Rice, and Knowlton, dated Feb. 15, 1889.

260

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 15, 1889.

Fred H. Beach, care of R. F. Osgood, Rochester, N. Y.:

Please find below a copy of a communication from the examiner concerning your application for letters patent for improvements in machines for attaching stays to the corners of boxes, filed June 10, 1885. Ser. No., 168,218.

Very respectfully, BENTON J. HALL,
Commissioner of Patents.

Room No. 215.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others, hereinafter specified, and the question of priority will be determined in conformity with the rules.

The statement demanded by rule 105 must be sealed up and filed on or before the 18th day of March, 1889, with the subject of the invention, and name of party filing it, indorsed on the envelope. The subject-matter involved in the interference is:

In a machine for attaching stays or fastening strips to boxes, the combination with a form and punch or plunger co-operating to attach a strip to a box, of a strip feeder, a strip-severing device, substantially as described; mechanism, substantially as described, for rendering the strip adhesive and a lug or arm for bringing a portion of the strip into position to be turned and pasted to the inside of the box.

This subject-matter of interference is the eleventh claim in the pending application of Horace Inman, of Amsterdam, N. Y., whose attorneys are Van Santvoord & Hauff, of Washington, D. C., and substantially includes your second and third claims.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 23. Interf. with Inman, dated Feb. 15, 1889.

261 58 ARCADE, ROCHESTER, N. Y., —— —; 18—.

168,218.

Fred H. Beach. Machine for attaching stays to boxes.

Filed June 10, 1885.

To the Commissioner of Patents.

SIR: Please recognize Messrs. Dayton, Poole & Brown, of Chicago, Ill., as my associates in above-named case, with full power to amend and to conduct all other business in the Patent Office connected therewith.

Respectfully,

R. F. OSGOOD,
Att'y for Fred H. Beach.

Rochester, N. Y., Sept. 1, 1890.

(Endorsed:) United States Patent Office, Sept. 8, 1890. U. S. Patent Office, division XVII, Sept. 8, 1890. Serial No., 168,218; paper No. 26. Asso. power of att'y. Filed Sept. 8th, 1890. F. H. Beach.

CHICAGO, ILL., *Nov.* 7, 1890.

In re application Fred H. Beach. "Machine for attaching stays to boxes." No. 168,218. Filed June 10, 1885.

Hon. Commissioner of Patents.

Sub. spec.

SIR: We amend *by cancelling the drawings heretofore furnished and substituting the three new sheets of drawings herewith filed, and also by cancelling the entire specification and claims and substituting therefore the following:*

Specification.

Be it known that I, Fred H. Beach, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful improvement in machines for attaching stays to the corners of boxes, and I do hereby declare that the following is a full, clear and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon which form a part of this specification.

It has been customary heretofore in making paper or strawboard boxes to apply a stay or fastening strip over the joints at the corners of the boxes, which strip is pasted down on the outside of the box, or is folded over the edge of the box and secured by paste, both outside and inside of the corner, and such work, as far as I am aware, has heretofore been done by hand. My invention relates to a machine for doing this work, and it consists in the matters hereinafter set forth and pointed out in the appended claims.

In the accompanying drawings illustrating my invention:
262 Figure 1 is a side elevation of a machine embodying the invention.

Figure 2 is a front elevation of the same in a plane at right angles to figure 1.

Figure 3 is a vertical cross-section taken upon line 3–3 of figure 2.

Figure 4 is a perspective view of the lower end of the upper die or plunger, and the secondary or turning-in plunger of the machine.

Figure 5 is a perspective view of the two plungers when placed together, showing the entire length of the same as seen from the rear side thereof.

Figure 6 is a perspective view of the front end of the lower die.

Figure 7 is a detail side elevation of the shears or cutters by which the strip is severed.

Figures 8 and 9 are sectional views showing the opposing clamping dies illustrating the process of applying the stay to the corner of the box.

Figure 10 is a sectional view of one corner of the complete box, taken on a plane parallel with the bottom of the box.

Figure 11 is a vertical section of parts of the machine taken upon line 11–11 of figure 2.

Figure 12 is a plan section taken upon line 12–12 of figures 2 and 11.

Figure 13 is a vertical section taken upon line 13–13 of figure 12, looking in the direction of the arrows in said figure.

Figure 14 is a detail section taken upon the line 14–14 of figure 3.

Figure 15 is a horizontal section, taken upon line 15–15 of figure 14 looking upwardly.

In the drawings A indicates the frame of the machine as a whole. Said frame may be of any suitable form. B is a block having two oblique faces on its upper surface and which is attached to the frame at the front of the latter, said block constituting a support upon which the corner of the box is placed at the time of applying the stay. C is a shaft located in suitable bearings at the top of the frame and by means of which motion is given to the several parts of the machine. Said shaft is provided with two main cam wheels, D and E, by which motion is given to the several parts of the *several parts of the* machine.
or strip-bender

Per F. G is a vertically movable die or plunger A arranged in guides *b b* upon the machine frame and vertically
263 over the form B. H is a secondary plunger located at the rear of and sliding upon the main plunger G. I is a lower die or anvil which is supported upon the form B beneath the plunger G and against which said plunger acts in the operation of the machine to press or clamp a stay strip against a box corner interposed between the said anvil or die and the said plunger. The upper surfaces, *i i*, of the anvil or die I are oblique and arranged at right angles with each other, and the upper die or plunger is also provided with working faces, *g g*, at right angles

with each other, and forming an angular notch or recess which fits over the die or anvil I so as to press equally upon the adjacent sides of an interposed box corner. The oblique sides of the die or anvil I, and the form B are preferably made to approximately coincide with each other so that both of said parts will afford support for the box corner in the operation of applying the stay thereto. The die or anvil, I, is herein shown as made of square form and the block B is provided with a V-shaped notch, *b*, in its top to receive said die, but this particular shape of the said notch, *b*, and of the lower part of the anvil is obviously not essential and they may be of any suitable shape. The said anvil I is herein shown as constructed to move horizontally and as extending through a horizontal-bearing aperture, *a*, in the frame, by which it is supported, a horizontal movement being given to the said anvil to aid in turning in or pasting the stay strips to the inside of the box-corner stay strips as will hereinafter appear.

J is a well or receptacle for paste located at one side of the clamping dies, and K a reel, on which is wound a strip of paper or other fabric, from which the stays are to be formed. O is a pasting or gluing roller, mounted in bearings over and extending into the well or receptacle J, and over which the strip passes from the reel K. and M N are feed-rollers operating in connection with an elastic bed, L, to feed forward the continuous stay strip from the glue-roller toward and between the clamping dies. The said elastic bed L consists of a series of parallel bars or wires, *l l l* (figures 11, 12 and 13), which are secured at their ends in the frame at either side of the rollers M and N. The lower feed-roller N is mounted to turn freely in its bearings and is provided with a plurality of circumferential grooves to receive the bars or wires, *l l l*, of the elastic bed L, the narrow annular flanges or ribs formed by said grooves projecting upwardly between said bars or wires, so as to bear upon the under surface of the stay strip. The said roller N is shown as
264 mounted in a movable frame N′ sustained by a spring arm *n* which holds the roller N against the stay strip. A cutting device for severing the continuous strip into pieces of suitable lengths to form the stay strips or fastening strips is located between the feed-rollers and the clamping dies and consists, as herein shown, of a stationary blade or cutter P secured to the machine frame at one side of the clamping dies and a vibrating knife or blade Q pivoted to the said frame. The stationary blade or cutter P is herein shown as attached to an overhanging horizontal part A′ of the frame which projects forward at one side of the clamping dies, and on which the lower feed-roller N and elastic bed are supported, said part A′ being provided with a recess or opening to receive said lower feed-roller and the movable frame N′. The movable knife or blade Q is shown as located between the stationary blade and the clamping dies, and as mounted on a pivot *q* secured on the part A′ of the frame.

Means are provided for actuating the several parts above described as follows: The cam wheel D is located adjacent to and at the rear of the plunger G, and the latter is provided with a stud or

roller *c*, which engages with a cam groove *d* on said cam wheel, said cam groove being so shaped as to give vertical reciprocatory motion to the plunger, and having a concentric part d^1, which gives a dwell to the plunger when the latter is at the lower limit of its movement, and with an inwardly deflected part d^2 which accomplishes the lifting and depression of said plunger. Said plunger G is preferably divided transversely into two separate parts G and G^1, connected with each other by a sliding joint and having between them a rubber or other spring G^2, by means of which the lower portion of the plunger is adapted to yield upwardly to a slight extent when brought down upon the box, thus preventing shock and liability of breakage and rendering the upper plunger adjustable to boxes of different thicknesses.

or strip-bender,

Per F. The secondary plunger A H, which, as hereinbefore stated, operates in connection with the reciprocating die, I, for turning in the end of the stay strip, rests and slides in a groove in the back of the main plunger, G (figures 4 and 5), and is provided with a projection or shoulder, g^1, adapted for engagement with the cam surface, D^1, upon the rim of the cam wheel, D. The said cam wheel is provided at one part of the said cam surface, D^1, with a cam projection, d^3, which acts to advance or depress said secondary plunger, H, relatively to the plunger G, at a desired time in the operation of the parts. The plunger, H, is retracted
265 or drawn up and held in contact with the rim of the cam, D, by means of a coiled spring, *h*, which acts upon the plunger, G, and said plunger, H. In the particular construction illustrated, the said coiled spring, *h*, is located in a groove of the secondary plunger, H, the lower end of the spring being attached to the secondary plunger and the upper end thereof being attached to a pin, h^1, which projects from the main plunger into the said groove.

The horizontally movable die, I, is provided at its rear end with a stud, i^1, which rests in a cam groove, *j*, in the cam wheel, E, said cam groove being located in the outer or cylindrical face of the cam wheel, and being provided with a straight part, e^1, which retains the die, I, in its forward or operative position during the greater part of the revolution of the cam, and with a rearwardly deflected part which moves said die, I, backwardly or rearwardly, and then again forward to its normal position, to accomplish the turning in of the stay strip.

The upper feed-roller M is preferably corrugated or roughened on its surface and serves in connection with the elastic bed L to carry or feed the strip forward over the said elastic bed. The said upper roller is operated by means of a segmental gear E^1 on the cam wheel E, which segmental gear engages with a cog wheel *m* on the shaft of the roller M. Said segmental gear operates to turn the feed-roller once at each rotation of the cam wheel a distance sufficient to feed forward a part of the strip of sufficient length to form a stay strip.

The cutting device for severing the paper is actuated as follows: The movable blade or cutter Q is extended at its inner end past its

pivotal point so as to form a projecting arm Q^1, which is pivoted at its rear end to a vertical slide R, which is held in the guide R^1 on the machine frame and is adapted to move vertically therein. Said slide-bar R is provided with a stud *r* which rests in a cam groove e^3 of the cam wheel E, which cam groove is so shaped as to actuate said movable blade at the proper time to sever the strip, and having for this purpose a concentric part e^4 which acts to hold the movable blade elevated, and an inwardly deflected part e^5 which acts to depress and elevate the said movable blade for severing the strip.

The machine may be driven by any suitable means, that shown in the drawing consisting of a belt pulley S mounted on the shaft C and adapted for connection therewith by means of a clutch S which is connected with a treadle T at the bottom of the machine.

The operation of the machine constructed as above de-
266 scribed is as follows: The continuous strip of paper or other fabric is drawn from the reel K by the feeding devices over the pasting roller O, by which a suitable supply of adhesive material is applied to the lower side thereof. The strip is fed by the feeding devices between the blades P and Q of the cutting device, and over the box corner resting on the form B and die I, at a time when the upper plunger is elevated, and the die I is in its advanced or outward position, the gear segment E^1 being so located as to engage and operate the cog wheel *m*, and thereby turn the feed-rollers when the main plunger is held in its elevated position by the engagement of the roller *g* with the concentric part d^1 of the cam groove *d*. After the end of the strip has been advanced over the box corner the cutting device is operated to sever the stay from the continuous strip and the plunger G at the same time descends and presses the cut strip against the corner of the box, and secures the same to the box walls at either side of the corner.

The movable blade Q of the cutting device is actuated at the proper time by the action of the inwardly deflected part, e^5 of the cam groove, e^3, which is so located as to give movement to the said blade shortly after the feed-roller ceases to move. The descent of the plunger G begins about the time the said blade begins to move, and the movement of the blade is somewhat faster than that of the plunger, owing to the fact that the roller *c* of said plunger is at this time in the central portion of the part d^2 of the cam groove *d*, while the roller *r* is moving along the abrupt part of the groove e^3, so that the movable blade will have completed the effective part of its stroke at about the time that the plunger reaches a point opposite the stationary blade. In other words, the movable blade and plunger move downwardly at about the same time, and the plunger reaches the level of the strip about the time that the same is severed by the cutters. Inasmuch as the corner or apex of a box resting upon the die I stands only slightly below the level of the stationary blade, so that after the strip has been fed forward over the box corner it will either fall upon and adhere to the box corner before it is severed from the continuous strip, or it will be carried downwardly against the box corner by the descending plunger at the moment it is severed and before gravity has had time to act.

In either case the liability of the severed strip being displaced after it is cut from the main or continuous strip is obviated, it being obvious that if from the stiffness of the material used for the stay strip the end thereof which is thrust forward by the feed-
267 rollers over the box corner does not fall or bend by gravity, so as to bring its adhesive lower surface against the box corner, the advance edges of the descending plunger acting against one or both ends of the cut-off strip at the same time the same is severed, will bring the middle of the strip immediately into contact with the box corner, and thereby hold the strip in place until the end portions of the strip are carried downwardly and pressed against the sides of the box.

The machine herein shown is, as hereinbefore stated, constructed to turn into the inside of the box the projecting end of the stay, and for this purpose the stay strip is made of such width and its guides are so arranged that the inner edge of the strip extends over or past the edge of the box wall, so that when the stay is pasted down on the outside of the box corner a loose or free end projects outward beyond the inner edge of the box. After the plunger G has pressed the stay upon the box, the sec-
or strip-bender
Per F. ondary plunger A H then descends and bends or turns this loose end vertically downward, as shown in figure 8. This movement of the plunger H is accomplished by the action on the projection d^1 of the cam projection d^3 of the cam surface D^1. The secondary plunger then rises and the die I, which has withdrawn from the notch *a* while the plunger H was descending, by the action of the deflected part e^2 of the cam groove *e*, moves forward again, and, catching the bent-down end of the stay, thrusts the same inside of the box cover and presses it against the inside of the box, the upper plunger G meanwhile resting upon the box corner, so as to retain the latter in place during the movement of the die, I. The operation of the parts in turning in the strip is clearly shown in figures 8 and 9, figure 8 showing the position of the parts when the die is withdrawn and the plunger, H, advanced or depressed to bend downwardly the overhanging inner end or edge of the strip, and figure 9 showing the die, I, during its forward movement, after the end of the strip has been carried inwardly and pressed against the inside of the box. During the withdrawal of the die, I, in the manner described the box corner is sustained in position by means of the form B, the inclined sides of which, as before stated, are arranged in alignment with the working faces of said die, I. The main purpose of said form, B, is to sustain the box corner when the die, I, is withdrawn; but said form is herein shown as made solid, and provided with a notch to receive the end of the die, I, so that the form serves as a support for the said die
268 under the downward pressure of the upper die or plunger; but by making the lower die, I, of sufficient strength or stiffness, the use of the form, B, as a support therefor will not be necessary.

In many boxes the stay is simply pasted against the exterior sur-

face of the box corner and is not turned in or over the edge of the same, in which case the work can be done by using a non-reciprocating angular lower die or anvil, and a single upper die or plunger. In such case the form, B, will, obviously, not be necessary as a part separate from the die, or, in other words, a single lower die or form will take the place of the form, B, and movable lower die, I.

In some cases a continuous stay strip may be employed which is covered or coated with dry adhesive material, in which case water will be used in the receptacle, J, and the roller, O, will operate to moisten the strip only.

Erase & insert F'.

In place of a strip-feeding device operating to carry a continuous strip to the clamping dies, such as is herein shown, a feeding device may be employed which is constructed to deliver to the box corner placed between the clamping dies a series of separate stay strips previously cut to the proper shape, without departure from my invention.

I claim as my invention:

1. The combination with opposing clamping dies, having diverging working faces of a feeding mechanism constructed to deliver stay strips, between said clamping dies and a pasting mechanism for rendering adhesive the stay strips, said clamping dies being constructed to co-operate in pressing upon interposed box corners the adhesive stay strips, substantially as described.

2. The combination with opposing clamping dies, having diverging working faces, said clamping dies being arranged to co-operate in pressing adhesive fastening strips upon interposed box corners, a feeding mechanism constructed to feed forward a continuous fastening strip, and a cutter for severing the said continuous strip into stay strips of suitable length, substantially as described.

3. The combination with opposing clamping dies, having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the dies a continuous fastening strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strip into stay strips of suitable length, substantially as described.

[Matter enclosed between rules erased in copy.]

Erase & insert F².

269 4. The combination with opposing clamping dies, having diverging working faces, of a movable part or plunger, constructed to bend downwardly or inwardly a projecting end of the stay into a position to be engaged by the clamping die, by which the said projecting end is pressed against the inside of the box corner, substantially as described.

5. The combination with opposing clamping dies, having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable [part or]* plunger A constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of said clamping dies which engages the inner surface of the box corner having a reciprocatory motion in a direction parallel with the box corner, so as to carry inward and press against the inside of the box corner the said projecting end of the stay strip, substantially as described.

Per F³. or strip-bender

6. The combination of opposing clamping dies having diverging working faces, constructed to co-operate in pressing an adhesive stay strip upon an interposed box corner, one of said clamping dies being constructed to act with an elastic or yielding pressure, to enable the dies to operate upon box corners of different thicknesses, substantially as described.

7. The combination with opposing clamping dies, having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a feeding mechanism constructed to feed forward a continuous fastening strip, a cutter for severing the strip into suitable lengths and a movable part or plunger which bends downwardly or inwardly the projecting end of the fastening strip, that one of the clamping dies which engages the inside of the box corner being constructed to reciprocate in a direction parallel with the box corner, substantially as described.

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

Erase per F[4].

8. The combination with a form or stationary die provided with a recess or notch, of a reciprocating die constructed to fit the notch, and having diverging working faces, and a movable die or plunger provided with diverging working faces corresponding with those of the said reciprocating die, and constructed to cooperate with the reciprocating die in pressing an adhesive fastening strip upon the corner of an interposed box, substantially as described.

8. [9].* The combination with a form or stationary die provided with a recess or notch, of a reciprocating die constructed to fit the notch, and having diverging working faces, a movable die or
270 plunger provided with diverging working faces corresponding with those of the said reciprocating die, and a secondary movable die or plunger constructed to bend downwardly or inwardly the projecting end of the fastening strip into position to be caught by the reciprocating die, substantially as described.

Remarks.

Amendments have been made both in the drawings and specifications, in order to make the same more fully and clearly show and describe the invention. The original drawings, while showing all parts of the machine, were not sufficiently full to clearly illustrate the same. Similarly, the original specification, while indicating the construction and operation of the machine, does not seem to be as full as is usually held to be desirable by the Patent Office. In amending the case care has been used to include nothing in the drawings or specification which was not contained in the same as originally filed. The new drawings have been prepared from the same model from which the original drawings were made, and differ only in the more complete illustration of the details of the machine. The feature which is more especially made clear is that of the "elastic bed L." In the original drawing this was shown only in side view, and both of the rollers "M" and "N" were described as acting on the stay strips, yet it did not clearly appear from the drawing that the said elastic bed is slotted or made up of a series of parallel bars, and that the lower roller N is grooved or ridged so as to bear against the stay stip between the bars. If the drawing and description are not made clear in this particular there is nothing to show how the said lower roller can have any effect whatever. Similarly the lower roller is mounted in a movable frame, which is supported on a spring arm, and these parts were but imperfectly shown in the original drawings.

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

An error has been corrected in Fig. 4, in which the cross-pin was shown as located at the lower end of the slot in the plunger, when as a matter of fact the spring will necessarily hold the upper part of the plunger and the said cross-pin at the upward limit of their movement.

Claim 1 as amended corresponds practically with ths issue of the interference, but is made slightly broader in terms, but not broader than applicant is entitled to in view of the state of the art. Applicant's claim should certainly be broad enough in scope to cover that class of staying machines (some of which have been recently
271 patented) in which previously cut stay strips are fed one by one to the box corner and the adhesive substance applied by the machine. Applicant is the first to construct a machine in which stay strips are automatically covered with adhesive material and fed to a box corner placed between angular dies, and in view of this fact he is clearly entitled to a claim such as claim 1 herewith presented. Said claim clearly avoids the only prior patent cited, to wit, that to Cohn, and is at the same time in such form as to cover other machines which have been devised since applicant made his invention, and which differ only in details of construction from his machine.

A favorable action on the claims presented is respectfully urged.

FRED H. BEACH,
By DAYTON, POOLE & BROWN, *Attorneys.*

(Endorsed:) U. S. Patent Office, Nov. 17, 1890. U. S. Patent Office, division XVII, Nov. 19, 1890. Serial No., 168,218; paper No. 35. Sub. specification. November 19, '90. F. H. Beach.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Dec.* 26, 1890.
Mailed " 27, 1890.

Machine for attaching stays to the corners of boxes. Ser. No., 168,218. Filed June 10, 1885.

F. H. Beach, care Dayton, Poole & Brown, Chicago, Ill.:

This application, as amended, has been considered.

The last paragraph of the specification introduces matter which does not conform with either the drawings or specification as they were at the time of filing the application, and must, therefore, be erased.

The broad term "mechanism," in claims 1, 2, 3 and 7, should be qualified by some such expression as "substantially as described."

The term "part," applied to the plunger, H, in claims 4 and 5, is one which is not used in the description, and which should, therefore, not be used in the claims.

Claims 4 and 5 are also the same in substance and claim 5 is the better claim.

In order to make claim 4 cover an operative construction, there must be understood what is covered by claim 5.

Claim 8 is objected to for the same reason as was claim 3 of the original specification in the first office letter of Aug. 20, 1885. This objection was overcome by the amendment of May 4, 1886,
272 by amending the specification, and may now be overcome in a similar manner. As the specification now stands, however, this claim is rejected for the reason named in the office letter referred to above.

Claims 1, 2, 3, 4, 7 and 8 are rejected.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 168,218; paper No. 36. Rejection, dated Dec. 26, 1890.

CHICAGO, ILL., *Dec.* 31, 1890.

In re application Fred H. Beach. "Machines for attaching stays to boxes." Filed June 10, 1885. No. 168,218.

Hon. Commissioner of Patents.

SIR: *We amend as follows:*

In the specification, page 4, line 13; page 7, line 10, and page 11, line 17, after "plunger" insert "or strip-bender."

F. *Erase the last paragraph of the specification, lines 4 to 9 of page*
F'. *13, and substitute the following:*

"As far as the main features of my invention are concerned forms other than those illustrated of the several parts of the machine may be employed without departure from my invention. As, for instance, in place of the particular mechanisms shown for feeding or delivering fastening strips or stay strips to and between the clamping dies, or for applying paste or glue to the said stay strips, other forms of strip feeding and pasting devices may be used in practice with the same general result as above described."

F². *Erase claim 4 and substitnte therefor the following:*

"4. The combination with opposing clamping dies having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable plunger or strip-bender constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of the clamping dies which engages the inner surface of the box corner being movable into and out of its usual working position whereby it may engage and carry inside of the box corner the said projecting end of the stay strip, substantially as described."

F³. *In claim 5, line 4, erase "part or," and same line, after "plunger" insert "or strip-bender."*

F⁴. *Erase claim 8.*

Remarks.

The paragraph of the specification objected to in the office letter has been erased and a new paragraph inserted
273 which is without specific reference to any other construction, and which is therefore unobjectionable, while making clear the fact that applicant's claims are broad enough in scope to include other devices than those shown for delivering stay strips between the clamping dies, such for instance as those in which previously cut stay strips are fed separately to the box corner.

Claim 4 has been amended to include unquestionably an operative combination, but it is in terms broader than claim 5, which latter claim is limited to the lower die movable substantially in the manner and in the direction shown in the drawings. It is possible to obtain the same result by a downwardly and outwardly swinging, instead of a reciprocating lower die, and claim 4 is accordingly worded to cover this construction. If not thus worded claim 4 would perhaps not cover the construction shown in the Inman application, which was placed in interference with this application on an issue involving this same feature, to wit: the "turning-in" device.

Claim 8 has been erased, as its subject-matter is fully covered by claim 9.

All formal amendments called for have been made except the insertion of the words "substantially as described." The insertion of these words is not objected to because they will necessarily change the scope of the claim, but because they will involve a useless repetition of said words in the claim. It is perfectly clear that the words "substantially as described" found at the end of each claim refer to each and every part mentioned in the claim, so that the repetition of these words after several of the descriptive clauses will in no sense change the meaning, which will be exactly the same whether the words mentioned are repeated after the clause describing each element or are placed at the end of the claim only to apply to all. If these words were not found at the end of the claim the objection of the examiner would be well founded, but as the matter stands, no good reason is seen for their insertion. In this connection it is desired to call the examiner's attention to the fact that claims like those now in the case are commonly allowed by many examiners in the office, by the board of appeals and by the Commissioner. As for instance, in *Ex parte* Holt, 29 O. G., 171, the Commissioner held that comprehensive words or phrases to include mechanical equivalents are proper if they clearly express
274 the invention, and clearly indicates that such words or phrases are proper without the qualifying words "substantially as described."

The attorneys have no desire to oppose the examiner in

his efforts to secure the issue of the patent in proper and legal form, and in fact are highly desirous of aiding to secure that end and will be glad to make any changes suggested that they can see any propriety in provided the invention is sufficiently protected. For reasons above stated, however, they cannot see that the change suggested is a desirable one.

Respectfully submitted.

FRED H. BEACH,
By DAYTON, POOLE & BROWN, *Attorneys.*

(Endorsed:) Patent Office, Jan. 3, 1891. U. S. Patent Office, division XVII, Jan. 3, 1891. Serial No., 168,218; paper No. 37. Amendment F. F. H. Beach.

Issue division. Serial No., 168,218.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,
U. S. PATENT OFFICE,
WASHINGTON, D. C., *Feb. 5th*, 1891.

Fred H. Beach, account Dayton, Poole & Brown, asso., Chicago, Ill.

SIR: Your APPLICATION for a patent for an IMPROVEMENT IN MACHINES FOR ATTACHING STAYS TO THE CORNERS OF BOXES, filed June 10, 1885, has been examined and ALLOWED.

The final fee, TWENTY DOLLARS, must be paid, and the letters patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY
275 AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of specification and drawings will be charged

for at the following rates: Single copies, uncertified, 10 CENTS EACH. The money should accompany the order.

Very respectfully, C. E. MITCHELL,
Commissioner of Patents.

☞ In remitting the final fee give the serial number at the head of this notice.

The within title is that given by the examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons MUST be given therefor on or before the payment of the final fee.

Memorandum of Fee Paid at U. S. Patent Office.

Amount received. Chief clerk.

(Be careful to give correct serial No.)

Serial No., 168,218.

Inventor:
Fred H. Beach.

Name of invention as allowed:
Machine for attaching stays to the corners of boxes.

Date of payment:
Feb. 5, 1891.

Fee:
Twenty dollars.

Date of filing:
June 10, 1885.

Date of circular of allowance:
Feb. 5, 1891.

The Commissioner of Patents will please apply the accompanying fee as indicated above.

DAYTON, POOLE & BROWN, *Attorneys.*

Send patent to Dayton, Poole & Brown, 215 Dearborn street, Chicago, Ill.

276 Serial No., 168,218. 1885. Ex'r Book No. 139,487.

Patent No. 447,225.
Fred H. Beach,
Of Rochester,
County of Monroe,
State of New York.
Invention: Machine for attaching stays to the corners of boxes.
30—139

Parts of application filed.
Petition, June 10, 1885.
Affidavit, " " "
Specification, " " "
Draw'g, 2 sheets, " " "
Model, not required.
Specimen, ——.
First fee, cash, $15, June 10, 1885.
" " cert., ——.
App. filed complete June 10, '85.

Jan. 31, 1891. L. M. E. Cooke.
Examined, Apr. 26, 1887. L. M. E. Cooke.
J. W. Babson.
Countersigned: T. W. Dick Bullock.
Feb. 4, '91. April 28, '87. For Commissioner.
Notice of allowance, April 28, 1887.
" Feb. 5, 1891.
Final fee, cash, [$20, Sept. 28, 1887.]*
" " cert., ——, 188–.
This final fee transferred to appl'n of Geo. V. H. Whitbeck, Oct. 22, '87. See letter 5787 B.
Cash, $20, Feb. 5, 1891.
Patented Feb. 24, 1891.
Att'y or P. O. address, R. F. Osgood, Rochester, N. Y.
Dayton, Poole & Brown, asso. [present],* Chicago, Ill.
93. Paper manufactures, box machines.

1885.

Contents.

½. Application, 1 paper[s].*
1. Aug. 20, 1885, letter.
2. May 4, '86, amendment A.
3. Sept. 3, 1886, rejection.
4. Nov. 10, '86, amend't B.
5. Nov. 16, 1886, letter.
277 6. Nov. 23, '86, sup. oath & amend't "C."
7. Dec. 3, 1886, letter.
8. Dec. 10, '86, amend't D.
9. Dec. 24, 1886, letter.
10. Jan. 28, 1887, rejection.
11. Feb. 23, 1887, letter.
12. Mar. 5, 1887, amend't E & letter from att'y.
13. March 7, 1887, int. with app. of Marshall.
14. April 4, 1887, decided in favor of Beach.
15. April 26, 1887, interference dissolved.
16. Sept. 27, 1887, withdrawn from issue.
17. Sept. 27, 1887, letter.
18. Dec. 27, 1887, int. with app. of Jaeger.

[* Words and figures enclosed in brackets erased in copy.]

19. Aug. 23, 1888, decided in favor of Beach.
20. Dec 1, 1888, interference dissolved.

Title: Improvement in machines for attaching stays to the corners of boxes.

21. Dec. 1, 1888, letter.
22. Feb. 15, 1889, int. A with apps. of Inman, Rice & Knowlton.
23. Feb. 15, 1889, int. C with app. of Inman.
24. Apr. 23, 1889, judgment against Rice in int. A.
25. May 14, 1889, int. A dissolved as to Rice.
26. Asso. power of att'y, Sept. 8th, 1890.
27. Mar. 17, 1890, int. A decided in favor of Beach.
28. May 1, 1890, int. A ex. of ints. affirmed by board.
29. Sept. 10, 1890, int. A ex'rs-in-chief affirmed by Comm'r.
30. Mar. 17, 1890, int. C decided in favor of Beach.
31. May 1, 1890, int. C ex. of ints. affirmed by board.
32. Sept. 10, 1890, int. C, board affirmed by Comm'r.
33. Oct. 9, 1890, int. A dissolved.
34. Oct. 9, 1890, int. C dissolved.
35. Sub. spec., Nov. 19, 1890.
36. Dec. 26, 1890, rejection.
37. Amendment F, Jan'y 3, 1891.
38.
39.
40.

Title: Improvement in machines for attaching stays to the corners of boxes.

278 DEFENDANTS' EXHIBIT CERTIFIED COPY OF FILE-WRAPPER AND CONTENTS OF BEACH'S REISSUE PATENT IN SUIT, No. 11167. W. K. B., Jr., Sp'l Ex'r.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the file-wrapper and contents, in the matter of the reissue letters patent granted Fred H. Beach, May 26, 1891, number 11167, for improvement in machine for attaching stays to the corners of boxes.

In testimony whereof I, W. L. Frothingham, acting Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 22d day of November, in the year of our Lord one [L. S.] thousand eight — and ninety-two, and of the Independence of the United States the one hundred and seventeenth.

N. L. FROTHINGHAM,
Acting Commissioner.

215 DEARBORN STREET, CHICAGO, ILL., *April* 6, 1891.

Amount received, $30, c'k. Chief clerk.

Hon. Commissioner of Patents, Washington, D. C.:

SIR: We herewith inclose petition, specification, oath, drawings, and the original patent in the matter of the application of Fred H. Beach, of Rochester, New York, for a reissue of patent No. 447,225.

279 We have ordered, through Mr. F. Jannus, of Washington, D. C., a certified copy of the abstract of title of said original patent No. 447,225. Will the office, in filing this order, please bring the same down to the date of filing of this application and deliver it to the examiner having charge of this reissue application herewith filed? Government fee $30, enclosed.

Please acknowledge receipt of this application.

Yours very truly, DAYTON, POOLE & BROWN.

(Endorsed:) U. S. Patent Office, Apr. 9, 1891. Chief clerk. U. S. Patent Office, division XVII, Apr. 15, 1891. Serial No., 388,344; paper No. 1.

Petition.

Hon. Commissioner of Patents, Washington, D. C.

SIR: Your petitioner, Fred H. Beach, a citizen of the United States, residing at Rochester, county of Monroe and State of New York, prays that he may be allowed to surrender the letters patent No. 447,225, for improvements in machines for attaching stays to the corners of boxes, granted to him Febr. 24, 1891, whereof the said Fred H. Beach is now the sole owner, and prays that letters patent may be reissued to him for the invention upon the annexed amended specification. With this petition is filed an abstract of title duly certified, as required in such cases.

Your petitioner hereby appoints Melville E. Dayton, C. Clarence Poole and Taylor E. Brown, doing business as copartners under the firm name of Dayton, Poole & Brown, No. 904 Owings bldg., Chicago, Ill., his attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the patent, and to transact all business in the Patent Office connected therewith.

FRED H. BEACH.

Specification.

To all whom it may concern:

Be it known that I, Fred H. Beach, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful improvement in machines for attaching stays

280 to the corners of boxes, and I do hereby declare that the following is a full, clear and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon which form a part of this specification.

It has been customary heretofore in making paper or strawboard boxes to apply a stay or fastening strip over the joints at the corners of the boxes, which strip is pasted down on the outside of the box, or is folded over the edge of the box and secured by paste, both outside and inside of the corner, and such work, as far as I am aware, has heretofore been done by hand.

My invention relates to a machine for doing this work, and it consists in the matters hereinafter set forth and pointed out in the appended claims.

In the accompanying drawings illustrating my invention: Figure 1 is a side elevation of a machine embodying the invention. Figure 2 is a front elevation of the same in a plane at right angles to figure 1. Figure 3 is a vertical cross-section taken upon line 3–3 of figure 2. Figure 4 is a perspective view of the lower end of the upper die or plunger, and the secondary or turning-in plunger of the machine. Figure 5 is a perspective view of the two plungers when placed together, showing the entire length of the same as seen from the rear side thereof. Figure 6 is a perspective view of the front end of the lower die. Figure 7 is a detail side elevation of the shears or cutters by which the strip is severed. Figures 8 and 9 are sectional views showing the opposing clamping dies illustrating the process of applying the stay to the corner of the box. Figure 10 is a sectional view of one corner of the complete box, taken on a plane parallel with the bottom of the box. Figure 11 is a vertical section of parts of the machine taken upon line 11–11 of figure 2. Figure 12 is a plan section taken upon line 12–12 of figures 2 and 11. Figure 13 is a vertical section taken upon line 13–13 of figure 12, looking in the direction of the arrows in said figure. Figure 14 is a detail section taken upon the line 14–14 of figure 3. Figure 15 is a horizontal section, taken upon line 15–15 of figure 14 looking upwardly.

In the drawings A indicates the frame of the machine as a whole. Said frame may be of any suitable form.

B is a block having two oblique faces on its upper surface and which is attached to the frame at the front of the latter, said block constituting a support upon which the corner of the box is placed at the time of applying the stay.

C is a shaft located in suitable bearings at the top of the
281 frame and by means of which motion is given to the several parts of the machine. Said shaft is provided with two main cam wheels, D and E, by which motion is given to the several parts of the machine.

G is a vertically movable die or plunger arranged in guides *b b* upon the machine frame and vertically over the form B.

H is a secondary plunger or strip-bender located at the rear of and sliding upon the main plunger G.

I is a lower die or anvil which is supported upon the form B beneath the plunger G and against which said plunger acts in the operation of the machine to press or clamp a stay strip against a box corner interposed between the said anvil or die and the said plunger. The upper surfaces, *i i*, of the anvil or die I are oblique

and arranged at right angles with each other, and the upper die or plunger is also provided with working faces, *g g*, at right angles with each other, and forming an angular notch or recess which fits over the die or anvil I so as to press equally upon the adjacent sides of an interposed box corner. The oblique sides of the die or anvil I, and the form B are preferably made to approximately coincide with each other so that both of said parts will afford support for the box corner in the operation of applying the stay thereto.

The die or anvil, I, is herein shown as made of square form and the block B as provided with a V-shaped notch, *b*, in its top to receive said die, but this particular shape of the said notch, *b*, and of the lower part of the anvil is obviously not essential and they may be of any suitable shape. The said anvil I is herein shown as constructed to move horizontally and as extending through a horizontal-bearing aperture, *a*, in the frame, by which it is supported, a horizontal movement being given to the said anvil to aid in turning in or pasting the stay strips to the inside of the box corner, as will hereinafter appear.

J is a well or receptacle for paste located at one side of the clamping dies, and K a reel, on which is wound a strip of paper or other fabric, from which the stays are to be formed.

O is a pasting or gluing roller, mounted in bearings over and extending into the well or receptacle J, and over which the strip passes from the reel K, and M N are feed-rollers operating in connection with an elastic bed, L, to feed forward the continuous stay strip from the glue roller toward and between the clamping dies. The said elastic bed L consists of a series of parallel bars or wires, *l l l*,
282 figures 11, 12 and 13, which are secured at their ends in the frame at either side of the rollers M and N. The lower feed-roller N is mounted to turn freely in its bearings and is provided with a plurality of circumferential grooves to receive the bars or wires, *l l l*, of the elastic bed L, the narrow annular flanges or ribs formed by said grooves projecting upwardly between said bars or wires, so as to bear upon the under surface of the stay strip. The said roller N is shown as mounted in a movable frame N^1 sustained by a spring arm *n* which holds the roller N against the stay strip. A cutting device for severing the continuous strip into pieces of suitable lengths to form the stay strips or fastening strips is located between the feed-rollers and the clamping dies and consists, as herein shown, of a stationary blade or cutter P secured to the machine frame at one side of the clamping dies and a vibrating knife or blade Q pivoted to the said frame. The stationary blade or cutter P is herein shown as attached to an overhanging horizontal part A^1 of the frame which projects forward at one side of the clamping dies, and on which the lower feed-roller N and XXX elastic bed are supported, said part A^1 being provided with a recess or opening to receive said lower feed-roller and the movable frame N^1. The movable knife or blade Q is shown as located between the stationary blade and the clamping dies, and as mounted on a pivot *q* secured on the part A^1 of the frame.

Means are provided for actuating the several parts above de-

scribed as follows: The cam wheel D is located adjacent to and at the rear of the plunger G, and the latter is provided with a stud or roller *c*, which engages with a cam groove *d* on said cam wheel, said cam groove being so shaped as to give vertical reciprocatory motion to the plunger, and having a concentric part d^1, which gives a dwell to the plunger when the latter is at the lower limit of its movement, and with an inwardly deflected part d^2 which accomplishes the lifting and depression of said plunger. Said plunger G is preferably divided transversely into two separate parts G and G^1, connected with each other by a sliding joint and having between them a rubber or other spring G^2, by means of which the lower portion of the plunger is adapted to yield upwardly to a slight extent when brought down upon the box, thus preventing shock and liability of breakage and rendering the upper plunger adjustable to boxes of different thicknesses.

The secondary plunger or strip-bender H, which, as hereinbefore stated, operates in connection with the reciprocating die
283 I, for turning in the end of the stay strip, rests and slides in a groove in the back of the main plunger, G, figures 4 and 5, and is provided with a projection or shoulder, g^1, adapted for engagement with the cam surface, D^1, upon the rim of the cam wheel, D. The said cam wheel is provided at one part of the said cam surface, D^1, with a cam projection, d^3, which acts to advance or depress said secondary plunger, H, relatively to the plunger G, at a desired time in the operation of the parts. The plunger, H, is retracted or drawn up and held in contact with the rim of the cam, D, by means of a coiled spring, *h*, which acts upon the plunger, G, and said plunger, H. In the particular construction illustrated, the said coiled spring, *h*, is located in a groove of the secondary plunger, H, the lower end of the spring being attached to the secondary plunger and the upper end thereof being attached to a pin, h^1, which projects from the main plunger into the said groove.

The horizontally movable die, I, is provided at its rear end with a stud, i^1, which rests in a cam groove, *j*, in the cam wheel, E, said cam groove being located in the outer or cylindrical face of the cam wheel, and being provided with a straight part, e^1, which retains the die, I, in its forward or operative position during the greater part of the revolution of the cam, and with a rearwardly deflected part, e^2, which moves said die, I, backwardly or rearwardly, and then again forward to its normal position, to accomplish the turning in of the stay strip.

The upper feed-roller M is preferably corrugated or roughened on its surface and serves in connection with the elastic bed L to carry or feed the strip forward over the said elastic bed. The said upper roller is operated by means of a segmental gear E^1 on the cam wheel E, which segmental gear engages with a cog wheel *m* on the shaft of the roller M. Said segmental gear operates to turn the feed-roller once at each rotation of the cam wheel a distance sufficient to feed forward a part of the strip of sufficient length to form a stay strip.

The cutting device for severing the paper is actuated as follows:

The movable blade or cutter Q is extended at its inner end past its pivotal point so as to form a projecting arm Q^1, which is pivoted at its rear end to a vertical slide R, which is held in the guide R^1 on the machine frame and is adapted to move vertically therein. Said slide-bar R is provided with a stud *r* which rests in a cam groove e^3 of the cam wheel E, which cam groove is so shaped as to
284 actuate said movable blade at the proper time to sever the strip, and having for this purpose a concentric part e^4 which acts to hold the movable blade elevated, and an inwardly deflected part e^5 which acts to depress and elevate the said movable blade for severing the strip.

The machine may be driven by any suitable means, that shown in the drawings consisting of a belt pulley S mounted on the shaft C and adapted for connection therewith by means of a clutch *s* which is connected with a treadle T at the bottom of the machine.

The operation of the machine constructed as above described is as follows: The continuous strip of paper or other fabric is drawn from the reel K by the feeding devices over the pasting roller O, by which a suitable supply of adhesive material is applied to the lower side thereof. The strip is fed by the feeding devices between the blades P and Q of the cutting device, and over the box corner resting on the form B and die I, at a time when the upper plunger is elevated, and the die I is in its advanced or outward position, the gear segment E^1 being so located as to engage and operate the cog wheel *m*, and thereby turn the feed-rollers when the main plunger is held in its elevated position by the engagement of the roller *g* with the concentric part d^1 of the cam groove *d*. After the end of the strip has been advanced over the box corner the cutting device is operated to sever the stay from the continuous strip and the plunger G at the same time descends and presses the cut strip against the corner of the box, and secures the same to the box walls at either side of the corner. The movable blade Q of the cutting device is actuated at the proper time by the action of the inwardly deflected part, e^5 of the cam groove, e^3, which is so located as to give movement to the said blade shortly after the feed-roller ceases to move. The descent of the plunger G begins about the time the said blade begins to move, and the movement of the blade is somewhat faster than that of the plunger, owing to the fact that the roller *c* of said plunger is at this time in the central portion of the part d^2 of the cam groove *d*, while the roller *r* is moving along the abrupt part of the groove e^3, so that the movable blade will have completed the effective part of its stroke at about the time that the plunger reaches a point opposite the stationary blade. In other words, the movable blade and plunger move downwardly at about the same time, and the plunger reaches the lever of the strip about the time that the same is severed by the cutters. Inasmuch as the corner or apex of a box resting upon the die I stands only slightly below the level of
285 the stationary blade, after the strip has been fed forward over the box corner it will either fall upon and adhere to the box corner before it is severed from the continuous strip, or it will be

carried downwardly against the box corner by the descending plunger at the moment it is severed and before gravity has had time to act. In either case the liability of the severed strip being displaced after it is cut from the main or continuous strip is obviated, it being obvious that if from the stiffness of the material used for the stay strip the end thereof which is thrust forward by the feed-rollers over the box corner does not fall or bend by gravity, so as to bring its adhesive lower surface against the box corner, the advance edges of the descending plunger acting against one or both ends of the cut-off strip at the time the same is severed, will bring the middle of the strip immediately into contact with the box corner, and thereby hold the strip in place until the end portions of the strip are carried downwardly and pressed against the sides of the box.

The machine herein shown is, as hereinbefore stated, constructed to turn into the inside of the box the projecting end of the stay, and for this purpose the stay strip is made of such width and its guides are so arranged that the inner edge of the strip extends over or past the edge of the box wall, so that when the stay is pasted down on the outside of the box corner a loose or free end projects outward beyond the inner edge of the box. After the plunger G has pressed the stay upon the box, the secondary plunger or strip-bender H then descends and bends or turns this loose end vertically downward, as shown in figure 8. This movement of the plunger H is accomplished by the action on the projection d^1 of the cam projection d^3 of the cam surface D^1. The secondary plunger then rises and the die I, which has withdrawn from the notch *a* while the plunger H was descending, by the action of the deflected part e^2 of the cam groove *e*, moves forward again, and, catching the bent-down end of the stay, thrusts the same inside of the box cover and presses it against the inside of the box, the upper plunger G meanwhile resting upon the box corner, so as to retain the latter in place during the movement of the die, I.

The operation of the parts in turning in the strip is clearly shown in figures 8 and 9, figure 8 showing the position of the parts when the die is withdrawn and the plunger, H, advanced or depressed
286 to bend downwardly the overhanging inner end or edge of the strip, and figure 9 showing the die, I, during its forward movement, after the end of the strip has been carried inwardly and pressed against the inside of the box. During the withdrawal of the die, I, in the manner described the box corner is sustained in position by means of the form B, the inclined sides of which, as before stated, are arranged in alignment with the working faces of said die, I. The main purpose of said form, B, is to sustain the box corner when the die, I, is withdrawn; but said form is herein shown as made solid, and provided with a notch to receive the end of the die, I, so that the form serves as a support for the said die under the downward pressure of the upper die or plunger; but by making the lower die, I, of sufficient strength or stiff-

ness, the use of the form, B, as a support therefor will not be necessary.

In many boxes the stay is simply pasted against the exterior surface of the box corner and is not turned in or over the edge of the same, in which case the work can be done by using a non-reciprocating angular lower die or anvil, and a single upper die or plunger. In such case the form, B, will, obviously, not be necessary as a part separate from the die, or, in other words, a single lower die or form will take the place of the form, B, and movable lower die, I.

In some cases a continuous stay strip may be employed which is covered or coated with dry adhesive material, in which case water will be used in the receptacle, J, and the roller, O, will operate to moisten the strip only.

As far as the main features of my invention are concerned, forms other than those illustrated of the several parts of the machine may be employed without departure from my invention, as, for instance, in place of the particular mechanism shown for feeding or delivering fastening strips or stay strips to and between the clamping dies, or for applying paste or glue to the said stay strips, other forms of strip feeding and pasting devices may be used in practice with the same general result as above described.

I claim as my invention:

1. The combination with opposing clamping dies, having diverging working faces of a feeding mechanism constructed to deliver stay strips, between said clamping dies and a pasting mechanism for rendering adhesive the stay strips, said clamping dies being constructed to co-operate in pressing upon interposed box corners the adhesive stay strips, substantially as described.

2. The combination with opposing clamping dies, having
287 diverging working faces, said clamping dies being arranged to co-operate, in pressing adhesive fastening strips upon interposed box corners, a feeding mechanism constructed to feed forward a continuous fastening strip, and a cutter for severing the said continuous strip into stay strips of suitable lengths, substantially as described.

3. The combination with opposing clamping dies, having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the dies a continuous fastening strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strip into stay strips of suitable length, substantially as described.

4. The combination with opposing clamping dies, having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable plunger or strip-bender, constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of the clamping dies which engages the inner surface of the box corner, being movable into and out of its usual working position, whereby it may engage and carry inside of the box corner the said projecting end of the stay strip, substantially as described.

5. The combination with opposing clamping dies, having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable plunger or strip-bender, constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of said clamping dies which engages the inner surface of the box corner having a reciprocatory motion in a direction parallel with the box corner, so as to carry inward and press against the inside of the box corner the said projecting end of the stay strip, substantially as described.

6. The combination of opposing clamping dies having diverging working faces, constructed to co operate in pressing an adhesive stay strip upon an interposed box corner, one of said clamping dies being constructed to act with an elastic or yielding pressure, to enable the dies to operate upon box corners of different thicknesses, substantially as described.

7. The combination with opposing clamping dies, having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a feeding mechanism constructed to feed forward
288 a continuous fastening strip, a cutter for severing the strip into suitable lengths and a movable part or plunger which bends downwardly or inwardly the projecting end of the fastening strip, that one of the clamping dies which engages the inside of the box corner being constructed to reciprocate in a direction parallel with the box corner, substantially as described.

8. The combination with a form or stationary die provided with a recess or notch, of a reciprocating die constructed to fit the notch, and having diverging working faces, a movable die or plunger provided with diverging working faces corresponding with those of the said reciprocating die, and a secondary movable die or plunger constructed to bend downwardly or inwardly the projecting end of the fastening strip into position to be caught by the reciprocating die, substantially as described.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRED H. BEACH.

Witnesses:
MARK D. KNOWLTON.
N. A. GLAZIER.

Oath.

STATE OF ILLINOIS, }
County of Cook, } ss:

Fred H. Beach, the above-named petitioner, being duly sworn, deposes and says that he does verily believe himself to be the original and first inventor of the improvements set forth and claimed in the foregoing specification and for which improvement he solicits a patent; that affiant does not know and does not believe that the said improvements were ever before known or used; that affiant is

a citizen of the United States of America and resides at Rochester, in the county of Monroe, in the State of New York; that affiant verily believes that the letters patent referred to in the foregoing petition and specification and herewith surrendered are inoperative, for the reason that the drawings thereof are defective and insufficient, and that said defect and insufficiency consists particularly in the fact that one of the parts of the machine shown in said drawings is improperly and incorrectly illustrated; and affiant further says that the errors which render said patent so inoperative arose from inadvertence and without any fraudulent or deceptive
289 intention on the part of affiant, and that the following is a true specification of the errors which it is claimed constituted such inadvertence relied upon, namely:

In figures 1, 2, 11, 12 and 13 the base, or table, marked A on said drawing is shown as extended across the form or part marked B, outside of the latter, so as to prevent the work from being properly placed upon or over said form B, notwithstanding the fact that said table, or base A, is not described in the specification as so extending across in front of the said form block, and is not so shown in the original drawings filed at the time the application for said letters patent was made by the said Fred H. Beach.

Affiant further says that the errors above particularly specified occurred by reason of the following facts, to wit: The draftsman who made the drawings accompanying the said patent was given a copy of the original drawings filed with the said application for said patent from which to make the said drawings accompanying the patent; that in making said drawings the said draftsman, by mistake and inadvertence, illustrated the said base plate A as extending across in front of the said form block B; that affiant, while he saw the said substitute drawings before they were sent to the Patent Office, made only a hasty examination of the same and did not detect the error made by the draftsman and did not afterwards see said drawings or any copy thereof until the patent was issued, when upon an examination of the said drawings affiant detected the error above referred to.

Affiant further states that immediately after the discovery of the said error he took steps to ascertain the desirability of reissuing the said patent to correct the said error in the drawings above referred to, and that he shortly afterwards decided that the patent should be so reissued and instructed his solicitors, Messrs. Dayton, Poole & Brown, of Chicago, Ill., to prepare and file a reissue application.

Affiant further states that said reissue application is not made for the purpose of covering any subsequent invention of another person, and that to the best of his knowledge and belief no rights have accrued since the said patent was issued which will in any way be interfered with by the grant of the reissue asked for.

FRED H. BEACH.

Subscribed and sworn to before me this 31st day of March, 1891.

F. B. HUTCHINSON,

[L. S.] *Notary Public.*

(Endorsed:) U. S. Patent Office, Apr. 9, 1891. Chief clerk. U. S. Patent Office, division XVII, Apr. 15, 1891. Serial No., 388,344; paper No. 1/2.

290 (2–155.)

No. 447,225.

The United States of America to all to whom these presents shall come:

Whereas Fred H. Beach, of Rochester, New York, has presented to the Commissioner of Patents a petition praying for the grant of letters patent for an alleged new and useful improvement in machine for attaching stays to the corners of boxes, a description of which invention is contained in the specification, of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of law in such case made and provided; and,

Whereas, upon due examination made the said claimant is adjudged to be justly entitled to a patent under the law:

Now, therefore, these letters patent are to grant unto the said Fred H. Beach, his heirs or assigns for the term of seventeen years from the twenty-fourth day of February, one thousand eight hundred and ninety-one, the exclusive right to make, use, and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the city of Washington, this twenty-fourth day of February, in the year of our [L. S.] Lord one thousand eight hundred and ninety-one, and of the Independence of the United States of America the one hundred and fifteenth.

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned.
C. E. MITCHELL,
Commissioner of Patents.

(Endorsed:) 388,344. U. S. Patent Office, Apr. 9, 1891. Chief clerk. U. S. Patent Office, division XVII, Apr. 15, 1891.

Inserted here in the original exhibit is a printed Patent Office copy of the specification and drawings of letters patent No. 447,225, dated Feb. 24, 1891, granted to Fred H. Beach.

CHICAGO, ILL., *Apr.* 16, 1891.

Hon. Commissioner of Patents.

SIR: We herewith enclose certified abstract of title in patent to F. H. Beach, machine for attaching stays to the corners of boxes, No. 477,225, for use in reissue application No. 388,344, filed April 9th, 1891.

Yours respectfully, DAYTON, POOLE & BROWN.

(Endorsed:) United States Patent Office, Apr. 18, 1891.

291 (2–174.)

THE UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that careful search has been made of the digest of this office and no assignment, agreement, license, power of attorney, or other instrument in writing is found of record up to and including April 3, 1891, under or relating to letters patent granted Fred H. Beach, Rochester, N. Y., February 24, 1891, No. 447,225, "machine for attaching stays to the corners of boxes."

In testimony whereof I, C. E. Mitchell, Commissioner of Patents, have caused the seal of the Patent Office to be hereunto [L. S.] affixed this thirteenth day of April, in the year of our Lord one thousand eight hundred and ninety-one, and of the Independence of the United States the one hundred and fifteenth.

C. E. MITCHELL,
Commissioner.

(Endorsed:) United States Patent Office, Apr. 18, 1891. U. S. Patent Office, division XVII, Apr. 18, 1891. Serial No., 388,344; paper No. —. 7717. D., '91.

(2–031.)

Issue division. 388,344.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,
U. S. PATENT OFFICE,
WASHINGTON, D. C., *May* 6, 1891.

Fred H. Beach, care Dayton, Poole & Brown, Chicago, Ill.

SIR: Your application for reissue of patent No. 447,225 for improvement in machine for attaching stays to the corners of boxes has been examined and allowed.

The patent will be forwarded to you as soon as practicable, in due order of business.

Very respectfully, C. E. MITCHELL,
Commissioner of Patents.

292 Serial No., 388,344. 1891. Ex'r's Book $\frac{22}{286}$.

Reissue. Div. 17.

No. 11167.
Fred H. Beach,
Of Rochester,
County of ——,
State of New York.
Invention: Machines for attaching stays to the corners of boxes.

Parts of application filed.
Petition, April 9, 1891.
Affidavit, " " "
Specification, " " "
Drawing, 3 sheets, " " "
Old patent, April 9, '91.
Abstract of title.
Cert. dep., ——.
Cash, $30, " 9, '91.
App. filed complete " 9, '91.
No. and date of original patent 447,225.
February 24, 1891.
Examined May 5, 1891. James Q. Rice.
Countersigned: J. W. Babson, for Commissioner.
May 6, '91.
Notice of allowance, May 6, 1891.
Reissued May 26, 1891.
Dayton, Poole & Brown, 904 Owing's bldg., Chicago, Ill.

293 Class ——.

1891.

Contents.

Application, 3 papers.
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11. 93. Paper manufacturers.
12. Box machines.
13.
14.
15.
16.
17.
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23.

Title: Improvement in machines for attaching stays to the corners of boxes.

(MEMORANDUM.—In the original exhibit here follow the drawings (3 sheets) of letters patent No. 11167, reissued May 26, 1891, to Fred H. Beach.)

294 United States Circuit Court, District of Massachusetts. In Equity.

FRED H. BEACH
vs.
THE HOBBS MFG. CO. ET AL. } No. 2988.

Stipulation.

In order to save time and expense to litigants in this case, it is stipulated that defendants' counsel will produce one of the alleged infringing machines, made by defendants, before the examiner, or to plaintiff's counsel, at or before the first session held for the examination of witnesses, or other proceedings, by defendants paying the proper freight or express charges, and that it will be admitted that defendants have made and sold at least one of such before the commencement of this suit, and since the reissue of the patent upon which this suit is based.

Dated Oct. 14th, 1892.

JOHN DANE, JR.,
Complainant's Solicitor.
EDWARD S. BEACH,
Defendants' Solicitor.

295 DEFENDANTS' EXHIBIT CERTIFIED COPY FILE-WRAPPER AND CONTENTS KNOWLTON'S PATENT, No. 447,955. L. W. H., Sp'l Ex'r.

(2–175.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the file-wrapper and contents in the matter of the letters patent granted Mark D. Knowlton March 10, 1891, number 447,955, for improvement in box-jointing machines.

In testimony whereof I, John S. Seymour, Commissioner of Patents, have caused the seal of the Patent Office to be affixed [SEAL.] this 4th day of April, in the year of our Lord one thousand eight hundred and ninety-four, and of the Independence of the United States the one hundred and eighteenth.

JOHN S. SEYMOUR,
Commissioner.

Amount received, $15.00, c'k. Chief clerk.

CHICAGO, *Feb'y 11th*, 1888.

The Hon. Commissioner of Patents.

SIR: Please find enclosed specifications and drawings in application for letters patent, as follows, namely: Inventor, Mark D. Knowlton; subject, box-jointing machine.

We transmit, also, herewith check for $15.00 to cover one first Government fee, to be applied in the above-named case.

Very respectfully,

DAYTON, POOLE & BROWN, *Attorneys.*

(Endorsed:) U. S. Patent Office. Rec. Feb. 14, 1888.

296 $15.

Petition.

To the Commissioner of Patents:

Your petitioner, a resident of Chicago, Illinois, prays that letters patent may be granted to him for the improvements in box-jointing machine set forth in the annexed specification.

And he hereby appoints M. E. Dayton, C. C. Poole and T. E. Brown, of Chicago, Illinois, doing business under the firm name of Dayton, Poole & Brown, his attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to sign the drawings, to receive the patent, and to transact all business in the Patent Office connected therewith.

MARK D. KNOWLTON.

The above appointment is approved.

Specification.

To all whom it may concern:

Be it known that I, Mark D. Knowlton, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful

patented in Great Britain on the 5th day of April, 1888, No. 5080,

Insert D. improvements in box-jointing machine, A and I do hereby declare that the following is a full, clear and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved machine for making the joints in the manufacture of boxes or other articles of paper, strawboard, wood veneer or similar material, and more particularly adapted for use in the manufacture of paper or strawboard boxes for the purpose of "setting up" or jointing the cut edges of the paper, strawboard or wood veneer box blank at the corners of the box. This invention relates more particularly to a machine organized for applying to the edges to be joined a strip or piece of paper or other material, which is caused to adhere to the parts by paste, glue or other adhesive substance. The invention consists in the matters hereinafter described and pointed out in the appended claims.

A machine, embodying my invention, embraces, as its main or essential features, clamping dies for pressing or forcing jointing strips against or in contact with the edges of the parts to be

297 joined, after paste, glue or other adhesive substance has been placed between the strip and the surfaces to which it is to be

applied, together with means for guiding or directing to or between said dies a paper strip from which the individual jointing strips are severed. As far as this main feature of the invention is concerned, the paper strip may be fed forward to the dies either by hand or otherwise. The machine herein shown embraces, as a separate and further improvement, an automatically acting feeding device, by which the paper strip is fed forward between the dies each time the latter are actuated for clamping the strip against the parts to be joined. The particular machine herein shown embraces, furthermore, as an additional improvement, an automatically acting cutting device for severing the jointing strips or pieces from the continuous strip, and for applying adhesive substances to said strip. The devices for applying adhesive substances are not essential in a machine embracing the main features of construction above illustrated, inasmuch as the strips may be previously coated with adhesive substance, which is allowed to dry, and is moistened by steam, or otherwise, shortly before it is applied to the parts to be joined, or paste or glue may be applied by hand to the jointing strips, or to the parts to be joined. The employment of means for continuously applying paste or glue to the strip as it is fed to the clamping dies is for several reasons preferred, and a machine embracing devices for this purpose is herein claimed as new, as are certain parts of the machine relating to the paste-applying devices. The machine may be employed for joining the edges of paper or strawboard articles, either when the parts to be joined are in the same plane, or when they are arranged at an angle with each other. The particular machine shown is for joining the sides of strawboard boxes, and the dies are therefore made one concave and the other convex and with flat faces arranged at an angle with each other.

In the machine herein illustrated, one of the clamping dies is constructed to reciprocate in applying the jointing strips, while the other remain immovable, and the paper strip is severed by a knife or cutter upon the machine frame acting in conjunction with a cutting edge of or upon the movable die. In said machine, furthermore, the non-reciprocating die or anvil block is bodily movable or adjustable with relation to the machine frame and the stationary cutter supported thereon, and said non-reciprocating die or anvil block is connected with the actuating devices by which the paper is fed forward, in such manner that the extent of the forward
298 movement of the paper strip will be changed, by moving the said adjustable die, to correspond with the width of the sides of the box to be joined by the strip, so that a jointing strip of the right length will in every instance be applied to the box.

The machine herein shown is, furthermore, adaped to be actuated by a foot lever, but a machine embracing similar features of construction may be operated by power or by the operator acting through other means than the foot lever. The invention may be more readily understood by reference to the accompanying drawings in which

Figure 1 is a plan view of the machine embodying one practical form of my invention.

Figure 2 is a side elevation thereof.

Figure 3 is a front elevation thereof.

Figure 4 is a vertical section taken upon line 4–4 of figures 1 and 3.

Figure 5 is a horizontal section taken upon the line 5–5 of figure 2.

Figure 6 is a perspective view of the main parts of the paper feeding devices removed from the machine.

Figure 7 is a detail perspective view showing some of the parts shown in figure 6 as viewed from below.

Figure 8 is a detail cross-section through the parts illustrated in figure 6, taken upon line 8–8 of figure 1.

Figure 9 is a perspective view of the sliding stationary die or anvil block removed from the machine.

Figure 10 illustrates a stationary cutter and its supporting plate detatched from the machine.

Figure 11 is a rear elevation of the movable die and cutter.

Figure 12 is a perspective view of the same, as seen from the front of the machine.

Figure 13 illustrates the cut and scored blank forming the box body before the corners are joined.

Figure 14 shows the corners after the jointing strip has been applied.

Figure 15 is a sectional view taken upon line 15–15 of figure 1.

Figure 16 is plain view of the paper folder and creaser.

Figure 17 is a sectional view of the same.

Figures 18 and 19 are sectional views of the same.

As shown in the drawings, the main frame of the machine is formed by an integral casting embracing a horizontal bed plate A,
299 a vertical part or standard A^1 at one end of the bed plate, and a flat vertical side plate or web A^2 arranged at one side of the bed plate and connected at its margin with the standard A^1. To the bed plate A are attached legs A^3 by which the machine is supported. Upon the frame thus constructed the several operative parts of the machine are mounted or sustained. B is a non-reciprocating die or stationary anvil block having the form of a bar or rod arranged horizontally and supported in the standard A^1 somewhat above the bed plate A. The said anvil block B extends at its end through the exterior vertical face of the frame standard A^1 and the projecting part forms the working surface of the die or anvil. The said anvil block B is fitted to slide longitudinally within its seat or bearing in the standard A^1 so that its end portion may be extended a greater or less distance from the face of the said standard. In a simple and convenient construction of the anvil block herein shown the latter is made semicircular upon its under face and provided at its outer end with flat working faces *b b* arranged at right angles with each other with their meeting edges upward. The anvil block may be held or clamped in place in any

suitable manner, the means for clamping as herein shown
Per A. consisting of a clamp bar B^1 resting at its [upper]* end against a laterally projecting arm a of the standard A^1 and bearing at its inner end upon a flat surface b^1 at the top of the inner portion of the anvil block. The clamp bar B^1 is held against and over the anvil block by means of a set-screw b^2 pass-
Per A'. ing through the clamp bar and entering the [standard]* near the anvil block. C is a movable part or reciprocating die of the clamping or pressing device, said die being arranged vertically over the end of the anvil block B which projects from the face of the standard A^1 and being provided with a "V" shaped notch or recess c in its under surface forming the working face of the die to engage with the oblique surfaces b b of the anvil block. The die C is attached to a vertically movable slide C^1 mounted in guides a^1 a^1 upon the standard A^1.

Said reciprocating die acts in conjunction with a stationary knife or cutter D to sever the separate jointing strips from the long or continuous strip fed to the machine. Said stationary knife or cutter is located over the stationary die block in such position that the said strip is fed or guided over said die block as the strip is advanced between the dies. The cutter is herein shown as held or supported in a removable plate D^1, which plate is bolted to the frame standard A^1, and is provided with an opening or passage d, through
300 which the strip passes to the dies, as will hereinafter more fully appear.

The slide C^1 which supports the die C, is in the machine illustrated, moved vertically for actuating the movable die C by the following devices: E is a heavy and strong bell-crank lever mounted upon a pivot e which is inserted through lugs or bearings a^2 a^2 located at the upper end of the standard A^1 and at the inner face thereof. The said bell-crank lever E is provided with a short horizontal arm E^1 which engages a recess c^1 in the upper part of the slide C^1. Said arm E^1 is herein shown as provided with a flat spring c^2 arranged to bear upwardly against the upper wall of the opening c^1 to take up lost motion in the parts. Said bell-crank lever E is provided with a second arm E^2 which extends obliquely downward to a point near the bed plate A. E^3 is a foot lever pivoted at its upper end to the machine frame by means of a pivot pin e^2 arranged near the lower end of the standard A^1. To the upper end of said foot lever is attached a rearwardly extending rigid arm E^4, which is connected with the lower end of the lever arm E^2 of the bell-crank lever by means of connecting plates E^5 E^5. When the lower end of the foot lever E^3 is thrown backwardly the lower end of the lever E^2 is thrown upwardly and inwardly, and the slide C^1 and upper die thereby depressed. When the foot lever is thrown forward, on the contrary, the die is elevated. I have herein shown a bar E^7, attached to the foot lever, sliding in a bracket E^8 upon the bed

[* Words and figures enclosed in brackets erased in copy.]

plate A and provided with a head e^3, as employed to limit the forward motion of the foot lever.

The continuous strip of paper to be fed to the machine for making the joints, is mounted upon a reel, F, sustained upon an arm, F^1, attached to the frame. *f*, in the drawing, indicates the paper strip. G is a folder, which acts upon said strip after the latter leaves the reel to double or crease the same in its middle, so that it will take and maintain a "V" shape at the time it is introduced between the clamping dies.

H is a pasting roller, the periphery of which is made of "V" shape to fit within the creased or folded lower surface of the strip, and H^1 is a presser roller for holding the strip in contact with the said pasting roller. The paper strip is carried forward or fed to the clamping dies after leaving the pasting roller by feeding devices acting to give an intermittent forward motion to the strip, whereby the end of the latter is carried rapidly or quickly forward be-
301 tween the clamping dies and over the margin of the box sides, placed over the stationary die and remains immovable, while the dies are being brought together and the jointing piece to be attached to the box is being severed from the continuous strip.

The said feeding device, in its main or essential features, comprises a reciprocating gripper, which engages and carries forward the paper strip in its forward movement, and becomes released from the strip at the limit of its forward movement, so as to move backly without producing any corresponding movement in the strip. The particular feature of construction herein illustrated in the feeding device and means for guiding the paper strip to the same and from said feeding device to the clamping dies are as follows: I (figures 1, 4, 5, 6, 7 and 8) is an "L" shaped guide-plate,
Per A^2. [which serves to guide the paper strip to the clamping dies]* and upon which the main operative parts of the feeding device are sustained. Said plate, I, is herein shown as provided with a vertical flange, I^1, at one of its edges, which flange is provided with a longitudinal guide-slot, *i*, in which the reciprocating gripper is held and guided. Said guide-plate is also
Per A^3. [preferably]* provided with an arm or bracket, I^2, by which it is secured to the machine frame. The main part of the guide-plate, I, is arranged beneath the path of the paper strip, so that the said strip passes longitudinally over said plate parallel with the guide-slot, *i*, thereof.

The said gripping device comprises a sliding plate, J, arranged vertically against the plate, I^1, and held in place by means of a plate, J^1, located at the opposite or exterior face of the said plate, I^1, and connected with the plate, J, through the slot, *i*. A filling piece, *j*, is desirably attached to the plate, J, within the said slot. J^2 is the lower jaw of the gripping device, said jaw being arranged centrally beneath the path of the paper strip, and provided with a sharp or narrow bearing edge, j^1, to engage the inner surface of the strip at the upper part or crease of the same. The said jaw, J^2, of the grip-

[* Words and figures enclosed in brackets erased in copy.]

per is connected with the lower edge of the sliding plate, J, by a horizontal arm or plate, j^2, located adjacent to the plate, I, and with its upper surface a sufficient distance below the edge, j^1, of the lower gripper, to avoid coming in contact with the corner margin of the folded or "V" shaped strip passing over it (figure 8). In the simple and convenient construction of these parts herein shown, the plate J, the plate j^2, and the gripper jaw, J^2, are formed or bent from a single piece of metal. J^3 is the upper or movable gripper jaw, which is arranged above the lower jaw, J^2, thereof, and is
302 made vertically movable, so that it may be either engaged with or lifted free from the said lower jaw. In the particular embodiment of the invention illustrated, the movable gripper jaw, J^3, is formed by or upon the end of the horizontal lever, J^4, which is mounted upon a pivot pin, j^3, affixed in the sliding plate, J, said lever, J^4, being arranged horizontally and its pivot, j^3, being arranged to overhang the path of the paper strip. The working face of the said gripper jaw, J^3, is herein shown as formed by *by* a separate piece of hard metal, serrated or roughened, to more positively engage the strip. J^5 is an arm for actuating the gripper arm, J^4, said arm J^5 being attached to and extended upwardly from the arm, J^4, and having at its upper end a horizontal crank pin j^4.

In a device embracing the general features of construction above set forth, the reciprocating part or plate carrying the grip-
Per A^4. ping jaws, and the jaws themselves, may be [separately]* any moved by a suitable actuating devices. As a simple and desirable construction of the parts, however, they are herein shown as so constructed that the reciprocating gripper-carrying plate J and the gripper is driven by actuating devices engaged with the upper end of the lever arm J^5 alone. For this purpose I provide frictional engagement between the said plate J and its guide, tending to retard the movement of the plate so that when pressure is applied to the upper end of the arm J^5 in a direction to carry the said upper end of the arm forward, the gripper arm J^4 will first be depressed, after which a continued forward pressure upon the upper end of the arm J^5 will carry the sliding plate and gripper jaws bodily forward. Similarly, when the pressure is applied to the upper end of the lever J^5 to move the same backwardly, the jaws will first be opened and the entire gripping device will then be moved bodily backward.

Any one of a great number of well-known devices may be employed
Per A^5. [herein shown]* for producing frictional engagement between the plate J and the guide-plate I^1. The device for this purpose herein shown (figure 5), comprises a flat spring J^5 resting at its middle against the plate J^1, and two screws J^6 inserted through the ends of said spring and through smooth openings in the plate J^1 and having screw-threaded engagement with the plate J. The spring J^5 holds the plates J and J^1 in forcible contact with the opposite sides of the guide-plate I^1 and by turning the screws

[* Words and figures enclosed in brackets erased in copy.]

J^6 J^6 the pressure of the spring may be adjusted as found necessary or desirable.

Devices herein illustrated for actuating the feeding mechanism are made as follows: K is a rocking lever which is pivotally
303 supported upon a shaft K mounted in the flange or web A^2 of the machine frame at a point near the rear end of the machine. Adjacent to its pivotal point, the lever K is provided with a rigid arm K^1 with which arm is engaged a bar K^2, the opposite or lower end of which is pivoted to the foot lever E^3. The rocking lever K is connected with the lever arm J^5 of the feeding device by means of a connecting rod K^3 engaged with a pivot K^1 upon the lever K and with the pivot pin J^4 of the said arm J^5.

The upper end of the bar K^2 is not pivotally connected with the arm K^1 of the lever K, but said arm K^1 is provided with a stud K^2 which engages a notch K^3 in the upper end of the said arm, and said lever is held in position for the engagement of said notch with the said stud by means of a supporting surface or abutment upon the machine frame, herein shown, as formed by an anti-friction roller K^4. The lever K is held at the rearward limit of its movement by a suitably applied spring, so that the forward movement only of the gripping device is given by the action of the bar K^2 and foot lever, the rearward or return movement of the gripping device being afforded by said spring.

In the particular construction herein shown in these parts, the shaft K of the lever K is rigidly attached to the arm and extends through and has bearing in the frame plate or web A^2. The said shaft, furthermore, extends outside of the web A^2 and is provided at its outer end with a collar K^4, to which is attached one end of a spirally coiled spring K^5, the opposite end of which is attached to the frame. Said spring tends to hold the rocking lever K normally at the rearward limit of its movement, and acts to promptly return the gripping devices to the starting point of the same after the bar K^2 has been drawn downwardly or retracted.

The stud K^2 of the arm K^1 is so located with reference to the bar K^2 that said stud will swing forward out of the notch K^3 of said arm after the arm has been lifted a short distance, and when the lever K has been swung forward a sufficient distance to give the movement in the gripping devices necessary for properly feeding the paper strip. The said bar K^2 may be held from being carried for-

mounted upon the shaft K (figure 15)

Per A^6. ward away from the roller K^4 by means of a roller K^6, A or otherwise. After the notch K^3 of the bar K^2 is released from the stud K^2 the upward movement of the bar is continued as the foot lever is thrust backward, without producing any movement in the gripping devices, until the clamping dies have been brought together and the necessary pressure put upon the parts to be joined and the jointing strip.

304 For applying jointing strips in the making of boxes of different sizes, it is obviously desirable that the distance to which the strip is fed forward past the cutting or severing devices at each advance movement of the feeding mechanism, should be

capable of variation, in order that the length of the strip used upon the box may correspond with the depth of the same. In connection with the stationary die or anvil block which is movable bodily to afford a greater or less distance between the cutting off mechanism and the end of the block, as hereinbefore described, I have provided a connecting mechanism between such movable anvil block and the parts by which the feeding devices are actuated, whereby the movement of the block a certain distance, will produce a corresponding change in the throw of the gripping jaws, whereby the length of the strip fed forward at each reciprocation of the gripping jaws, will correspond approximately with the length of the exposed part of the anvil block and the joint to be made.

Devices herein shown, for the purpose above described, are constructed as follows: The pivot pin K^1, which connects the rocking lever K with the connecting rod K^3, instead of being immovably secured in the lever K, is adapted for longitudinal movement upon said lever. For this purpose the said pin is herein shown as mounted upon a sliding block L, engaged with a guide-groove K^6 in the said lever. L^1 is a bell-crank lever, which is mounted upon a pivot I, located beneath the inner end of the anvil block or bar B, and provided with an upwardly extending arm having engagement with the block, and with a horizontal arm, the free end of which is connected with the said sliding block L by means of a connecting rod L^2. The connection between the bell-crank lever L^1 and the anvil block B is herein shown as formed by means of a plate L^3 attached to the side of the said anvil block and provided with a vertical groove L^2, which engages a pivot pin L^3 in the upper end of the vertical arm of said bell crank lever. When the said anvil block, connected with the pivot pin K^1 of the lever K, in the manner

Per A^7. described, is thrust [inwardly,]* (outwardly) said pivot pin will be carried or moved upwardly away from the shaft of the said rocking lever K, thereby giving a greater throw to said pivot pin and increasing the throw of the gripping devices. When, on the contrary, the anvil block is moved inwardly, the pivot K^1 is moved inwardly upon the rocking lever K, thereby decreasing the throw of said pin K^1 and giving a less movement in the

305 gripping devices, and decreasing the distance through which the paper strip is fed forward at each action of the feeding mechanism.

The particular construction herein shown in the guide-plate I,

Per A^8. for guiding the paper strip [R on]* (from) the pasting roller to the gripping devices, and from said gripping devices to the clamping dies is as follows: At the rear end of

Per A^9. the guide-plate [L^1]* (I) is located a rigid plate I^3, arranged at right angles with said guide-plate and extending over the path of the paper strip. Said plate I^3 is provided in its lower edge with a "V"-shaped notch I^1 to engage the upper surface of

[* Words and figures enclosed in brackets erased in copy.]

the strip. Upon the end of the plate I, opposite the said guide-plate I^3, is located a "V"-shaped guide-bar I^4, which also extends over the strip and engages the upper surface thereof. Along the upper surface of the plate I, at the central line of the paper strip, is located a longitudinal guide-strip I^5, consisting of a narrow strand or filament of metal, the upper margin of which is arranged in approximately the same horizontal plane as the upper end of the lower gripping jaw J^2, and which is constructed to engage the under surface of the paper strip within the seam or crease thereof. The purpose of this said guide-strip is to hold the paper strip accurately in position with relation to the gripping devices, so that the crease in the paper strip will come exactly over the lower gripping jaw and thus prevent a distortion of the strip when the same is gripped between the jaws. The said strip I^5 is herein shown as supported by being attached to a plate I^2, which is secured to the plate I at the end of the latter at which the paper strip enters the guiding devices. At its opposite or forward end, the guide-strip I^5 is unsupported, the plate I being cut away beneath the strip at this point so as to form an opening or recess I^6 (figures 4 and 7) within which the upper edge or corner of the working face of the anvil may enter, when said anvil is thrust inwardly for operating upon shallow boxes or covers. The said guide-strip I^5 may, however, be sustained or held from lateral movement by engagement with the lower gripping jaw J^2 at one side of which said strip passes. A preferred construction in these parts is illustrated in figure 8, in which the guide-strip is shown as beveled at one side only to give it a sharp or narrow edge, located at that face of the strip which is in contact with the gripping jaw, while the said jaw has a similar shape, being made flat at its side in contact with the guide-strip and beveled at its opposite or outer side. By this construction the upper edges of both the strip and gripping jaw may be made to engage the crease
306 of the paper strip, while at the same time the said gripping jaw may be reciprocated without interfering with the guide-strip. If found necessary or desirable, a small lug or projection

Per A[10]. [J^7, figure 8]* may be placed upon the arm J^3 in position to engage the inner face of the guide-strip I^5, thereby forming with the jaw J^2, a notch in which the said guide-strip is held and guided. The said notch will, however, be made slightly

Per A[11]. deeper than the [thickness, width]* of the guide-strip, so that the upper gripping jaw will act against the lower

Erase & substitute A[12]. jaw J^2, [and will not press against the upper edge of the guide strip].*

I^7 I^7 are two guide-rods, which are located above the guide-plate I, one at each side of the guide-strip I^5 at such distance apart as to engage the upper surface of the paper strip near the lateral margins thereof. Said guide-rods aid in keeping the strip accurately in position with relation to the gripping jaws of the feeding mechanism, and are also of use to prevent the sides of the

[* Words and figures enclosed in brackets erased in copy.]

folded or creased paper strip from bending or curling up, on account of the moisture in the paste or glue applied thereto. The said guide-bars I^7 I^7 may be attached to or supported from the plate I in any desired manner. As herein illustrated they are inserted and secured to their ends in the guide-plate I^3 and guide-bar 14.

At its end nearest the clamping dies the plate I is herein shown as provided with a "V"-shaped extension I^8 adapted to enter the opening D of the plate D^1 by which the stationary cutter D is directly supported. Said plate I^8 serves to guide the paper strip until the latter reaches the said cutter. The projection I^8 is herein shown as provided at its top with a vertical flange I^9 the upper edge of which rests against the top of the said opening D. The sides of the said projection I^8, together with the flange I^9, serve to hold the ends of the guide devices accurately in position with reference to the knife and the clamping dies by their engagement with the walls of said opening D.

I have found that in the use of rollers H H^1, such as herein shown, for applying to the paper strip, that when the said strip is carried or moved rapidly forward by the action of the feeding mechanism described, the impetus acquired by the paste-rollers as they are turned by the paper is liable to cause the said rollers to continue to turn in a manner to thrust the paper forward, after the gripping jaws have completed their forward movement. To avoid this result I so construct the upper roller H^1 that it may be lifted to free it from the lower roller H, and I provide means whereby the upper roller will be automatically lifted free from the
307 lower roller at the moment the forward movement of the gripping jaws is terminated. When the parts are thus constructed the paper strip is released from the paste-rollers before the latter have an opportunity to act upon the strip in a manner to carry it forward. For the general purposes above set forth, the upper feed-roller may be lifted or moved by any upwardly moving part of the machine acting against the feed-roller support at the proper time.

In one practical embodiment of this part of the invention herein illustrated, these parts are made as follows: The upper roller H^1 is
secured upon one of
mounted upon a pivot pin [H^1 having bearings at its
Per A^{13}. opposite ends in]* two parallel arms H^2 H^2, which are rigidly connected with each other and are mounted upon a rigid pivot pin H^2 affixed in the frame plate A^3. Upon the end of one of the arms H^2 is formed or attached an arm or striker H^3 located in position to engage the stud K^2 of the rocking lever K when the said stud has nearly reached the upward limit of its movement. When the said lever K is actuated by the
Per A^{14}. notched bar K^2, therefore, the [supporting]* arms H^2 H^2 and the roller H^1 will be lifted at the moment the feeding device reaches the forward limit of its movement and said roller H^1 will be supported free from the paper strip, until the foot lever is swung rearwardly and the bar K^2 retracted preparatory to another succeeding operation of the machine. The lower paste-

[* Words and figures enclosed in brackets erased in copy.]

roller A is constructed to enter a tank or receptacle H^4 containing paste or other adhesive substance so as to become coated upon its margin in a manner heretofore common and well understood. H^5 is a scraper arranged to fit against the "V"-shaped periphery of the said feed-roller to remove the surplus adhesive substance therefrom.

The cutter or shear blade D, employed to sever that part of the jointing strip applied to the box walls from the main or continuous part of the strip, in the manner hereinbefore stated, acts, in the particular construction illustrated, in connection with the cutting edge formed at the rear surface of the movable clamping die, C, as the movable die descends toward the work. Any separate knife or cutter on the movable die is rendered unnecessary in the particular construction shown, by making the rear face and working surface of the movable die of hardened steel.

Per A^{15}. The stationary knife, or cutter, [$\overset{D}{M}$],* is herein shown as made preferably of thin or sheet metal and of inverted "V" shape, said cutter being secured to

Per A^{16}. 308 the plate, D^1, by screws, [as shown].* (the heads of which are shown) A plate, M^1, secured to the plate D^1, above said cutter, aids in holding the same in place. Said plate, M^1, is provided with an opening, M^1, (figure 10) through which the strip passes over the knife. The forward or advance edge of the cutter forms the cutting edge thereof, and the said cutter is held up to its work by screws placed behind it or otherwise.

The movable die, C, may be constructed in any suitable or preferred manner to afford a suitable cutting edge at its rear surface. In the particular construction herein illustrated, the working surface of the die is formed in a cylindric block, C^2, of hardened steel, the lower surface of which block is provided with a "V"-shaped notch corresponding in form with opposing surface of

Per A^{17}. the die block, [$\overset{B}{D}$].* The rear or inner end surface of

Per A^{18}. the said hardened block [$\overset{\text{moves}}{\text{rests}}$]* in contact with the

Per A^{19}. [$\overset{\text{face}}{\text{edge}}$]* of the cutter, [$\overset{D}{M}$],* so that the [square]* edges of the notch act in connection with the said cutter to sever the paper strip. I have herein shown the block, C, as held within the head of the die by splitting the latter vertically and inserting one or more clamp screws, C^3, for holding the split parts together. A screw, C^4, inserted in the head and overlapping the die block, C, serves to hold the guide-block from being thrust endwise out of the head, and to adjust said block with reference to the stationary cutter.

In figure 13 is shown the cut and scored corner of a box blank before the jointing strip is applied to the same, and in figure 14 is shown the finished corner after the jointing strip has been applied. In the operation of the machine the operator sits or stands in front

[* Words and figures enclosed in brackets erased in copy.]

of the same and places the corners of the box blank, split and scored, as shown in figure 13, upon the upper surface of the anvil, B, below the movable die, the sides of the box being bent or held approximately at right angles with the bottom when the blank is placed upon the anvil block. When the corner of the blank is thus held upon the block the foot lever, E^3, is actuated, with the result of quickly thrusting forward the end of the strip over the edges of the blank and then depressing the upper die to sever the strip and forcing it into contact with the surface of the blank. The folder, G, herein shown, comprises a curved plate, G^1, V form with its

Per A^{50}. which is bent into [tubular shape, with the]* side walls arranged at some distance apart at their rear ends, but brought together or parallel with each other at their forward ends, so as to gradually bring together the margins of the strip,

309 thereby bending the paper strip into "U" shape, and to then fold or crease the strip as it emerges from the

Insert C. folder. A

The machine herein shown illustrates one practical embodiment of the main features of my invention, which latter may obviously be carried out by a in a machine differing in its details of construction

Erase & insert D'. [mechanism differing materially in its details]* from the particular one herein shown. One of the main features of the invention is embodied in a construction embracing a clamping device and

Erase & insert C'.

> guides for directing the paper strip to the clamps, and, as far as this feature of the invention is concerned, the paper strip may be fed to the clamping dies flat or uncreased, and automatically acting feeding devices may or may not be employed. A construction embracing such automatically acting feeding mechanism is, however, herein claimed as a separate improvement.

Another important feature of construction herein illustrated embraces in the connection between the movable or adjustable anvil block and the actuating devices by which the feed devices are operated whereby the length of paper fed forward at each motion of the machine may be varied to correspond with the depth of the box to cover, and, as far as this feature of the invention is concerned the gripping devices may be made otherwise than in the particular manner illustrated, and the connection between the movable die block and the said actuating devices may be made otherwise than

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

as shown. The particular machine illustrated, however, contains many novel details of construction which in themselves are made the subjects of specific claims herein.

I claim as my invention:

Erase & insert A^{21}.

1. A machine for the purpose described, comprising opposing clamping dies, and a guide for directing a jointing strip to and between said dies, substantially as described.

2. A machine for the purpose stated, comprising opposing clamping dies, a guide for directing a jointing strip to and between said dies, and *means* for severing the said jointing strip, substantially as described.

3. The combination, with a stationary anvil block or die and an opposing movable die, of a guide for directing a jointing strip to and between said dies, and a stationary knife or shear blade operating in connection with a cutting edge upon the movable die, to sever the jointing strip, substantially as described.

4. The combination, with opposing clamping dies, and guides for a jointing strip, of automatic *means* acting upon the strip to advance the same to the said clamping dies, substantially as described.

5. The combination, with opposing clamping dies, and guides for a jointing strip, of *means* acting upon the strip for advancing the same toward the clamping dies, and an automatically acting knife or cutter for severing the strip, substantially as described.

6. The combination, with opposing clamping dies, and guides for a jointing strip, of *means* acting upon the strip to advance the same toward the clamping dies, and *means* for applying adhesive substance to the strip, substantially as described.

7. The combination, with clamping dies, *means* for feeding a jointing strip to and between said dies, and *means* for folding or creasing the strip longitudinally, substantially as described.

8. The combination, with convex and concave clamping dies having flat faces arranged at an angle with each other, of a guide for a

[Matter enclosed between rules erased in copy.]

jointing strip, constructed to direct said strip endwise between the dies, in the direction of the line of junction between the flat faces thereof, substantially as described.

9. The combination, with an anvil block, an opposing movable die and a stationary knife or cutter, acting in connection with a cutting edge upon the movable die, said anvil block being movable upon the machine frame, of *means* for feeding forward a jointing strip past or over the knife, and *means* connecting the said anvil block with the feeding devices, whereby the distance which the strip is fed forward may be varied to correspond with the depth of the box to be operated upon, substantially as described.

10. The combination, with clamping dies, and a guide for a jointing strip of a feeding device embracing a reciprocating carrier, gripping jaws mounted thereon, and *means* giving reciprocatory motion to said gripping jaws and carrier, substantially as described.

11. The combination, with clamping dies, of a feeding device embracing a reciprocating carrier provided with a jaw engaging one side of the jointing strip, a gripping jaw engaging the opposite side of the said strip, provided with a crank arm, *means affording fractional engagement between the said carrier and the machine frame*, and *means* engaging the said crank arm and giving reciprocatory motion to the carrier and actuating the gripping jaw, substantially as described.

12. The combination, with clamping dies, of a feeding device *embracing* a reciprocating carrier and gripping jaws mounted thereon, and *means* for giving reciprocatory motion
311 to said carrier and jaws, embracing a rocking lever, means for actuating the same, a connecting rod, and a stud or pivot pin mounted upon the rocking lever and engaging the connecting rod, said stud or pivot pin being adjustable longitudinally upon the said rocking lever, substantially as described.

13. The combination, with an anvil block or die adjustably supported upon the machine

[Matter enclosed between rules erased in copy.]

frame, an opposing movable die, and a stationary knife or cutter acting in connection with a cutting edge upon the movable die, of a reciprocating feeding device embracing a carriage and gripping jaws mounted thereon, and *means* for giving reciprocatory motion to said feeding device, *embracing* a rocking lever, *means* for actuating the same, a connecting rod, a pivot or stud movable longitudinally upon the rocking lever, and operative *connection* between the said die block and the said pivot, pin or stud, whereby the stud is moved toward or from the pivot of the lever when the anvil block is shifted, substantially as described.

14. The combination, with an anvil block or die adjustably supported upon the machine frame, an opposing movable die, and a stationary knife or cutter acting in connection with a cutting edge upon the movable die, of a reciprocating feeding device embracing a carriage and gripping jaws mounted thereon, and *means* for giving reciprocatory motion to said feeding device, embracing a rocking lever, *means* for actuating the same, a connecting rod, a pivot or stud upon the said rocking lever engaging the connection *rod*, said pivot or stud being movable longitudinally upon the rocking lever, and operative connection between the said adjustable die block and the said pivot, pin or stud, embracing a bell-crank lever connected with the anvil block, and a connecting rod or bar connected with said lever and stud, substantially as described.

15. In a machine for the purpose stated, a stationary anvil, block or die, an opposing movable die, and a stationary knife or cutter acting in connection with a cutting edge upon the said movable die, substantially as described.

In testimony, that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses.

MARK D. KNOWLTON.

M. E. DAYTON.
TAYLOR E. BROWN.

[Matter enclosed between rules erased in copy.]

312 *Oath.*

STATE OF ILLINOIS, }
County of Cook, } ss:

Mark *E.* Knowlton, the above-named petitioner, a citizen of the United States and a resident of Chicago, in the county of Cook and State of Illinois, being duly sworn, deposes and says that he verily believes himself to be the original, first, and sole inventor of the improvements in box-jointing machine described and claimed in the foregoing specification; that the same has not been patented to him or to others with his knowledge or consent in any country; that the same has not to his knowledge been in public use or on sale in the United States for more than two years prior to this application, and that he does not know and does not believe that the same was ever known or used prior to his invention thereof.

MARK D. KNOWLTON.

Subscribed and sworn to before me this 6th day of February, A. D. 1888.

[L. S.] T. EVERETT BROWN,
Notary Public.

(Endorsed:) U. S. Patent Office. Rec. Feb. 14, 1888. Serial No. 263,998; paper No. 1. Application. Filed Feb'y 14, 1888.

(MEMORANDUM.—In original exhibit here follows a Patent Office copy of letters patent No. 447,955, dated March 10, 1891, granted to Mark D. Knowlton.)

Copied.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Oct.* 24, 1888.
Mailed Oct. 25, 1888.

Box-jointing machine. Serial No., 263,998. Filed Feb. 14, 1888.

Mark D. Knowlton, care of Dayton, Poole & Brown, Chicago, Ills.:

This application has been examined.

It is not clear how the plate I can in any sense be said to "guide" the paper. See line 13, page 8.

"Upper," third line from the bottom, page 5, should be "outer."

"Standard," line 3, page 6, should be "arm A."

"Preferably," line 18, page 8, should be erased.

The construction described, lines 24 to 26 inclusive, page 9, not being shown, this description should be erased. See *Ex parte Witty and Caffrey*, 29 O. G., 861.

The sentence beginning at line 9, page 10, is unintelligible.

313 The roller K^6, third line from bottom, page 11, is not lettered in the drawings.

"Inwardly," line 5, page 13, should be "outwardly."

"R on," line 15, page 13, should be "F from."

"L^1," line 17, page 13, should be "P^1."

The result specified, beginning at "so," line 1, page 15, does not follow from the construction specified in the immediately preceding sentence.

Referring to lines 16 and 17, page 16, the pin h^1 appears to have a bearing at one end only, and in one only of the arms H^2 H^2. See Fig. 1.

The reference letters, D and M, are confused. They appear to refer to the same part.

The screws for securing the cutter M to the plate D^1 are not shown as stated, line 16, page 17.

It is thought that "rests," next to last line, page 17, should be "moves," and that "edge," same line, should be "face," and "square," same line, should be erased.

It is thought to be incorrect to say that the plate G^1 is of tubular shape. Line 23, page 18.

Claims 1 to 6 inclusive, 8, and 10, are rendered too indefinite to be considered on account of the use of the term "guide," which term is applied to but one part in the description, and to that part improperly, as stated above.

Claim 7 is too vague and indefinite in terms to comply with the requirements of the statute (see *Ex parte* Paige, 40 O. G., 807), but is met by German patent 38721, of 1887, box machines.

Referring to claim 11, "means affording frictional engagements between the said carrier and the machine frame," is neither shown nor described. The frictional engagement is with the guide of the plate J. See bottom of page 9 and top of page 10.

Claims 11 and 12 cover illegitimate combinations, no legitimate combination existing between the clamping dies and the particular kind of feeding device. These claims, however, are fully met by Van Geasen, 192,793, July 4, 1877, label and tag machines.

Claim 15 is met by Sill, 84223, November 17, 1888, attaching labels.

The broad term "means" throughout the claims, and "connection" in line 9 of claim 13, should be qualified by some such expression as "substantially as described."

Claims 11, 12 and 15 are rejected. Further action on the
314 merits must be postponed until the formal objections have been disposed of. See *Ex parte* Mill, 40 O. G., 918.

Amendment should be made without delay on account of probable interference with other pending applications.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Assistant Examiner.

(Endorsed:) Serial No., 263,998; paper No. 1. Rej., dated Oct. 24, 1888.

Ex'r's room 25.

CHICAGO, ILL., *November* 7, 1888.

Hon. Commissioner of Patents.

SIR: *In re* application Mark D. Knowlton, "box-jointing machine," filed Feb. 14, 1888—serial No., 263,998—

We name as follows:

A. *In the specification, page 5, line 28, erase "upper" and substitute "outer."*

A[1]. *Page 6, line 3, erase "standard" and substitute "arm a."*

A[2]. *Page 8, lines 13 and 14, erase the words "which serves to*

A[3]. *guide the paper strip to the clamping dies." Same page, line 18, erase "preferably."*

A[4]. *Page 9, line 25, erase "separately." Same line, before "suitable" insert "any."*

A[5]. *Page 10, line 10, erase "herein shown" and substitute "may be employed."*

A[6]. *Page 11, line 28, after "roller K[6]" insert "mounted upon the shaft K (figure 15)."*

A[7]. *Page 13, line 5, erase "inwardly" and substitute "out-*

A[8]. *wardly." Same page, line 15, erase "R on" and substitute*

A[9]. *"F from." Same page, line 17, change "L[1]" to "I[1]."*

A[10]. *Page 14, line 26, erase "J[5]" and substitute "F[7]," (figure 8).*

A[11]. *At the end of line 29, page 14, and beginning of line 1, page*

A[12]. *15, erase the word "thickness" and substitute "width." On said page 15, lines 2 and 3, erase beginning with "and will" line 2 to the end of line 3 and substitute* "without thrusting *said guide-strip downwardly against the bottom of said notch."*

A[13]. 315 *Page 16, lines 16 and 17, erase the words "having*

A[14]. *bearings at its opposite ends in" and substitute "secured upon one of." Same page, lines 23 and 24, erase "supporting."*

A[15]. *Page 17, line 14, erase "M" and substitute "D." Line 16,*

A[16]. *erase "as shown" and substitute "the heads of which are shown*

A[17]. *in figure 3." Same page, line 29, erase "D" and substitute "B."*

A[18]. *Same line, erase "rests" and substitute "moves."*

A[19]. *Line 30, erase "edge" and substitute "face." Same line, change "M" to "D." Same line, erase "square."*

Page 18, line 23, erase the words "tubular shape with the"

A[20]. *and substitute "'U' form with its."*

Erase the claims and substitute the following:

A[21].
Erase & insert
B.

1. A machine for the purpose described, comprising opposing clamping dies, and a means, substantially as described, for guiding a jointing strip to and between said dies.

2. A machine for the purpose stated comprising opposing clamping dies, means substantially as described for guiding a jointing strip to and between said dies, and means for severing the said jointing strip.

3. The combination, with a stationary anvil block or die and an opposing movable die, of means substantially as described for guiding a jointing strip to and between said dies, and a stationary knife or shear blade operating in connection with a cutting edge upon a movable die to sever the jointing strip.

4. The combination, with opposing clamping dies, of automatic means substantially as described acting upon the strip to advance the same to the said clamping dies.

5. The combination, with opposing clamping dies, of means substantially as described acting upon the strip for advancing the same toward the clamping dies, and an automatically acting knife or cutter for severing the strip.

6. The combination, with opposing clamping dies, of means substantially as described acting upon the strip to advance the same toward the clamping dies, and means substantially as described for applying adhesive substance to the strip.

7. The combination, with convex and concave clamping dies having flat faces arranged at an angle with each other, of means substantially as described for guiding a jointing strip endwise between the dies in the direction of the line of juncture between the flat faces thereof.

316 8. The combination with clamping dies having flat faces arranged at an angle with each other, of means substantially described for folding or creasing longitudinally a jointing strip, and means substantially as described for guiding said jointing strip endwise between the dies.

[Matter enclosed between rules erased in copy.]

9. The combination, with an anvil block, an opposing movable die and a stationary knife or cutter acting in connection with a cutting edge upon the movable die, said anvil block being movable upon the machine frame, of means substantially as described for feeding forward a jointing strip past or over the knife, and means substantially as described connecting the said anvil block with the feeding devices, whereby the distance which the strip is fed forward may be varied to correspond with the depth of the box to be operated upon, substantially as described.

Erase & insert B³.

9 [10, 4].* The combination, with clamping dies of means substantially as described for guiding a jointing strip to the said dies, and a feeding device embracing a reciprocating carrier, and gripping jaws mounted thereon and adapted to engage the said jointing strip.

10 [11, 5].* The combination with clamping dies, of means substantially as described for folding or creasing longitudinally a jointing strip and a feeding device embracing a reciprocating carrier and gripping jaws thereon, one of which jaws is provided with a narrow edge engaging longitudinally the crease or fold of the strip.

11 [12, 6].* The combination with clamping dies, of means substantially as described for folding or creasing longitudinally a jointing strip, and a feeding device embracing a longitudinally arranged guide-strip having a narrow edge engaging the crease or fold of the jointing strip, a reciprocating carrier, and gripping jaws mounted on the carrier, one of said jaws being provided with a narrow edge arranged longitudinally of the jointing strip and also engaging the crease or fold of the same.

12 [13, 7].* The combination, with an anvil block or die adjustably supported upon the machine frame, an opposing movable die, and a stationary knife or cutter acting in connection with a cutting edge upon a movable die, of a reciprocating feeding device embracing a carriage, and gripping jaws mounted thereon, and means for giving reciprocating motion to said feeding device embracing a rocking lever,

[Matter enclosed between rules erased in copy.]
[* Words and figures enclosed in brackets erased in copy.]

means for actuating the same, a connecting rod, a pivot or stud, said pivot or stud being movable longitudinally upon the rocking lever, and operative connections substantially as described between the said die block and the said pivot
317 pin or stud, whereby the stud is moved toward or from the pivot of the lever when the anvil block is shifted.

13 [14, 8].* The combination, with an anvil block or die adjustably supported upon the machine frame, an opposing movable die, and a stationary knife or cutter, acting in connection with a cutting edge upon the movable die, of a reciprocating feeding device embracing a carriage and gripping jaws mounted thereon, and means for giving reciprocatory motion to said feeding device embracing a rocking lever, means for actuating the same, a connecting rod, a pivot or stud upon the said rocking lever engaging the connecting rod, said pivot or stud being movable longitudinally upon the rocking lever, and operative connection between the said adjustable die block and the said pivot pin or stud embracing a bell-crank lever connected with the anvil block, and a connecting rod or bar connected with said lever or stud.

Will the office please cause the reference letters of the drawing to be changed and corrected as follows: Place upon the roller described in third line from bottom, page 11, the reference letter K^6. *Erase the reference letter M and substitute D.* Both the letters D and M are applied to the same parts in most of the figures in the drawing, and the letter D need be added, therefore, only in cases where it does not already appear.

Remarks.

Original claims 11 and 12 have been erased inasmuch as the matters contained therein are more broadly covered in other claims. The present 11th and 12th claims cover matters not before claimed and a supplemental oath is appended to cover the subject-matter of the claims. Claim 15 appears to be met and is therefore erased. Formal changes having been made as suggested by the office, a favorable action on the case is respectfully urged.

MARK D. KNOWLTON,
By DAYTON, POOLE & BROWN, *Attorneys.*

(Endorsed:) U. S. Patent Office, Nov. 12, 1888. U. S. Patent Office, division XVII, Nov. 23, 1888. Serial No., 263,998; paper No. 2. Amendment A. Mark D. Knowlton.

[* Words and figures enclosed in brackets erased in copy.]

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DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Dec.* 6, 1888.
Mailed Dec. 10, 1888.

Box-jointing machine. Ser. No., 263,998. Filed Feb. 14, 1888.

Mark D. Knowlton, care of Dayton, Poole & Brown, Chicago, Ill.:

This application, as amended, has been examined.

Claims 1 to 5, inclusive, 7 and 8 are met by English patent 7807, May 28, 1887, box machines.

Claim 5 is met by Sill, before cited.

Claim 9, depending as it does on the broad term "means" for the expression of invention over what is shown in the English patent cited above, is too indefinite under *Ex parte* Paige, cited in the last office letter.

Claims 1 to 8 are rejected.

Amendment is required within ten days on account of the interference heretofore mentioned.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Assistant Examiner.

(Endorsed:) Serial No., 263,998; paper No. 3. Rej., dated Dec. 6, 1888.

Associate Power of Attorney.

The Honorable Commissioner of Patents:

Please recognize Frankland Jannus as associate in the prosecution of the application of M. D. Knowlton filed, No. 263,998, for improvements in box-jointing machine, and address all communications relating thereto to him.

Signed Washington, D. C., this 17th day of December, 1888.

DAYTON, POOLE & BROWN.

(Endorsed:) U. S. Patent Office. Rec'd Dec. 18, 1888. U. S. Patent Office, division XVII, Jan. 9, 1889. Serial No., 263,998; paper No. 4. Asso. power of att'y.

CHICAGO, ILL., *Jan.* 19, 1889.

Hon. Commissioner of Patents.

SIR: *In re* application Mark D. Knowlton, "box-jointing machine," filed Feb. 14, 1888, Serial No., 263,998—

We amend as follows:

Erase claims 1 to 9, both inclusive, and substitute the following:

B.
Erase & insert C².

319 "1. The combination, with convex and concave clamping dies having flat faces arranged at an angle with each other, of means substantially as described for guiding a jointing strip endwise between the dies in the direction of the line or juncture between the flat faces thereof, means substantially as described for applying an adhesive substance to the strip, and an automatically acting knife or cutter for severing the strip.

"2. The combination, with clamping dies having flat faces arranged at an angle with each other, of means substantially as described for folding or creasing longitudinally a jointing strip, means for applying adhesive substance to the strip, and means substantially as described for guiding said jointing strip endwise between the dies.

"The combination, with an anvil block, an opposing movable die and a stationary knife or cutter acting in connection with a cutting edge upon the movable die, said anvil block being movable upon the machine frame, of means substantially as described for feeding forward a jointing strip past or over the knife, and means substantially as described connected with the said anvil block and with the feeding devices and operating to change the throw of the feeding devices when the anvil block is moved, whereby the distance which the strip is fed forward will be changed to correspond with the depth of the box operated upon, substantially as described."

Change the numerals of claims 10 to 14.

Remarks.

The claims have been restricted as above, in view of the English patent cited and are now thought to clearly present patentable matter.

Amendment was required within ten days after the last action, but by unavoidable accident the making of the amendment has been delayed. In [illegible] there is any other application pending or allowed, in which there is likely to be an interference, the office is asked to declare such interference, as required by the rules, even

[Matter enclosed between rules erased in copy.]

though the interfering application may have already passed to issue.

Yours respectfully,
MARK D. KNOWLTON,
By DAYTON, POOLE & BROWN, *Attorneys.*

(Endorsed:) U. S. Patent Office. Rec'd Jan. 21, 1889. U. S. Patent Office, division XVII, Jan. 21, 1889. Serial No., 263,998; paper No. 5. Amendment B.

320 DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 15, 1889.
Mailed Feb. 16, 1889.

Box jointing machine. Ser. No., 263,998. Filed Feb. 14, 1888.

Mark D. Knowlton, care of Frankland Jannus, city:

This application, as amended, has been considered.

The words "convex" and "concave" are incorrectly used in claim 1. These terms are properly applied to curved surfaces only.

Claim 3, depending as it does for the statement of invention over what is known in English patent 1428, Jan. 29, 1887, box machines, upon the broad term "means" is too vague to meet the requirements of the statute. See *Ex parte* Paige before cited.

In order to avoid further delay the interference heretofore referred to, will be this day declared, and amendment as indicated above will be required after the dissolution of the interference.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 263,998; paper No. 6. Letter, dated Feb. 15, 1889.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 15, 1889.

Mark D. Knowlton, care of Frankland Jannus, city:

Please find below a copy of a communication from the examiner concerning your application for letters patent for improvements in box-jointing machines, filed Feb. 14, 1888, Ser. No., 263,998.

Very respectfully, BENTON J. HALL,
Commissioner of Patents.

Room No. 215.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others hereinafter specified, and the question of priority will be determined in conformity with the rules.

321 The statement demanded by rule 105 must be sealed up and filed on or before the 18th day of March, 1889, with the subject of the invention, and the name of the party filing it, indorsed on the envelope. The subject-matter involved in the interference is:

The combination with a die or form having diverging cheeks, of a punch or plunger having diverging faces corresponding to the die, said punch and die co-operating to lay an adhesive fastening strip upon the corner of an interposed box, a feeding device, substantially as described, for feeding the strip directly between the die and punch, and a cutter for severing the strip into suitable lengths, substantially as described.

The subject-matter of the interference is the second claim in the pending application of Horace Inman of Amsterdam, N. Y., whose attorneys are Van Santvoord & Hauff of Washington, D. C., and substantially includes the first, fourth, fifth and sixth claims of said Inman's application, the first claim in your application, the claim in the pending application of David Rice, of Amsterdam, N. Y., whose attorney is Alex. P. Browne of 82 Water street, Boston, Mass., and the first claim in the pending application of Fred H. Beach of Rochester, N. Y., whose attorney is R. F. Osgood of Rochester, N. Y.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 263,998; paper No. 7. Interfer. Inman, Rice, and Beach, dated Feb. 15, 1889.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 15, 1889.

Mark D. Knowlton, care Frankland Jannus, Washington, D. C.:

Please find below a copy of the communication from the examiner concerning your application for letters patent for improvements in box-jointing machines, filed Feb. 14, 1888, Ser. No. 263,998.

Very respectfully, BENTON J. HALL,
Commissioner of Patents.

322 Room No. 215.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the rules.

The statement demanded by rule 105 must be sealed up and filed on or before the 18th day of March, 1889, with the subject of the invention; and name of party filing it, indorsed on the envelope.

The subject-matter involved in the interference is:

The combination with clamping dies having flat faces arranged at an angle with each other, of means, substantially as described,

for folding or creasing longitudinally a jointing strip, means for applying adhesive substance to the strip, and means, substantially as described, for guiding said jointing strip endwise between the dies.

This subject-matter of interference is your second claim and substantially includes the claim in the pending application of David Rice, of Amsterdam, N. Y., whose attorney is Alex. P. Browne, of 82 Water street, Boston, Mass., the third and tenth claims in the pending application of Horace Inman, of Amsterdam, N. Y., whose attorneys are Van Santvoord & Hauff, of Washington, D. C., and the first, second and third claims in the pending application of Gustav L. Jaeger, of New York, N. Y., whose attorneys are Van Santvoord & Hauff, of Washington, D. C.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Ass't Examiner.

(Endorsed:) Serial No., 263,998; paper No. 8. Inter. Rice, Inman, and Jaeger, dated Feb. 15, 1889.

Ser. No. 263,998, paper No. 9. Judgment against Rice in int. A. Dated April 23, 1889.

Ser. No. 263,998, paper No. 10. Int. A, dissolved as to Rice. Dated May 14, 1889.

Ser. No. 263,998, paper No. 11. Int. A, decided in favor of Beach. Dated March 17, 1890.

Ser. No. 263,998, paper No. 12. Int. A, ex. of ints. affirmed by board. Dated May 1, 1890.

Ser. No. 263,998, paper No. 13. Int. A, board affirmed by Commissioner. Dated Sept. 10, 1890.

323 Ser. No. 263,998, paper No. 14. Int. B, decided in favor of Knowlton. Dated March 17, 1890.

Ser. No. 263,998, paper No. 15. Int. B, ex. of ints. affirmed by board. Dated May 1, 1890.

Ser. No. 263,998, paper No. 16. Int. B, board affirmed by Commissioner. Dated Sept. 10, 1890.

Ser. No. 263,998, paper No. 17. Int. A, dissolved. Dated Oct. 9, 1890.

Ser. No. 263,998, paper No. 18. Int. B, dissolved. Dated Oct. 9, 1890.

(Papers not in file.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Oct.* 9, 1890.
Mailed Oct. 11, 1890.

Div. XVII. Box-jointing machine. Ser. No., 263,798. Filed Feb. 14, 1888.

Mark D. Knowlton, care Frankland Jannus, city:

Priority of invention having been decided in favor of your opponent in the recent interference (No. 13376) in which this applica

tion has been involved, you are hereby advised, under rule 132, that your claim (1) which was involved in the issue stands finally rejected.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Assistant Examiner.

(Endorsed:) Serial No., 263,998; paper No. 19. Letter, dated Oct. 9, 1890.

Hon. Commissioner of Patents.

SIR: *In re* application Mark D. Knowlton, "box-jointing machine," filed Feb. 14, 1888, No. 263,998—

We amend as follows:

In the specification, page 18, after line 28, insert:

C. "It will, of course, be understood that a previously prepared gummed strip may be employed in the machine
321 shown, in which case the pasting or gluing device shown will be used merely to apply water to the strip
C. moistening the gum or glue thereon. Obviously, means other than the particular gluing or pasting devices shown may be employed, either for applying paste or glue to the strip or for applying water to a previously gummed or pasted strip, without departure from my invention."

Erase lines 2 to 7, both inclusive, page 19, and substitute the following:

"means for creasing or folding the strip before it is fed to
C'. the clamping device, and as far as this part of the invention is concerned, the said clamping and folding devices may be made otherwise than in the particular manner shown, and other features of the machine illustrated may be omitted without departure from my invention. As for instance, the paste or glue may be applied by hand instead of automatically by the machine, or the adjusting devices for the lower clamping die or anvil may be absent."

Erase claims 1, 2, and 3 and substitute the following:

"1. The combination with clamping dies having flat faces
C². arranged at an angle with each other, said dies co-operating to press an adhesive fastening strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, substantially as described.

"2. The combination with clamping dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, and a feeding mechanism for the strip, substantially as described.

Erase & insert D^2.

"3. The combination with clamping dies having flat faces arranged at an angle with each other, or a folder or creasing device operating to fold or crease longitudinally a jointing strip, a feeding mechanism for the strip and a cutting device for severing the strip.

"4. The combination with clamping dies having flat faces arranged at an angle with each other, or a folder or creasing device operating to fold or crease longitudinally a continuous jointing strip, a paste or glue applying device for rendering the strip adhesive, a feeding mechanism for the strip and a cutting device for severing the strip, substantially as described.

"5. The combination of an anvil block, and an opposing movable die, said anvil block and die co-operating to press an adhesive jointing strip upon the corner of an interposed box, and said anvil block being bodily movable on
325 the machine frame, a cutting device for severing the strip into suitable lengths, a feeding mechanism for the strip embracing an adjusting device by which the movement or throw of the feeding devices may be changed and an operating connection between the movable anvil and the said adjusting device, by which the adjusting device is controlled by the shifting of the anvil, substantially as described.

Erase & Insert D^3.

"6. The combination with clamping dies having flat faces arranged at an angle with each other, of cutters having angular cutting edges, substantially as described.

"7. The combination with clamping dies having flat faces arranged at an angle with each other, of a stationary knife or cutter having angular cutting edges, that one of said dies which is movable being provided with angular cutting edges acting in connection with the cutting edges on the said stationary knife or cutter, substantially as described.

"8. The combination with clamping dies having flat faces arranged at an angle with each other, of a folder or creasing device operated to fold or crease longitudinally a jointing strip, and cutters having angular cutting edges, substantially as described."

[Matter enclosed between rules erased in copy.]

In claim 6 (*original* 12) *last line, erase* "*also.*"
Renumber the other claims.

Remarks.

The claim which was involved in interference has been erased and the case amended in several particulars to place the same in condition for allowance. The new claim 1 is slightly broader in terms than the issue of interference "B" but not broader than applicant is entitled to in view of the state of the art. Said claim clearly includes the elements necessary for an operative machine, because it is obviously possible to apply glue to the strip by hand instead of automatically by the machine.

Claims 6, 7 and 8 cover matter not heretofore claimed and a supplemental oath is furnished in view thereof.

A favorable action on the case as amended is respectfully urged.

MARK D. KNOWLTON,
By DAYTON, POOLE & BROWN, *Attorneys.*

326 *Supplemental Oath.*

STATE OF ILLINOIS, }
County of Cook, } *ss:*

Mark D. Knowlton, whose application for letters patent for an improvement in box-jointing machine (serial No., 263,998) was filed in the United States Patent Office on or about the 14th day of February, 1888, being duly sworn, deposes and says that he verily believes himself to be the original and first inventor of the improvement as described and claimed in the foregoing amendments in addition to that which was embraced in the claims originally made, and that he does not know and does not believe that the same was ever before known or used, and that the matter sought to be inserted formed a part of his original invention at the date of filing said application, and was invented by him before he filed the same.

MARK D. KNOWLTON.

Sworn to and subscribed before me this 9th day of December, 1890.

[L. S.] C. CLARENCE POOLE,
Notary Public.

(Endorsed:) United States Patent Office, Dec. 11, 1890. U. S. Patent Office, division XXIX, Dec. 12, 1890. U. S. Patent Office, division XVII, Dec. 16, 1890. Serial No., 263,998; paper No. 20. Amendment C. Filed ——, 189–. Mark D. Knowlton.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Jan.* 10, 1891.
Mailed Jan. 12, 1891.

Div. XVII.

Box-jointing machine. Ser. No., 263,998. Filed Feb. 14, 1888.

Mark D. Knowlton, care of Frankland Jannus, city:

This application, as amended, has been considered.

Acknowledgment should be made in the preamble of the specification, and by a supplementary oath of the British patent to applicant No. 5080, of 1888, and also any other foreign patents which may have been granted.

The statement in the last four lines of page 18 renders the scope of the claims vague and indefinite and should be erased.

Claims 3, 6, 7 and 8 are met by English patent 848, of 1887, box machines, and claims 6 and 7 appear to be in substance the same.

327 Claims 9, 10 and 11, former 4, 5 and 6, are also found to be met by the reference just cited.

Claims 3, 6, 7, 8, 9, 10 and 11 are rejected.

L. M. E. COOKE, *Examiner.*

G. A. NIXON,
Assistant Examiner.

(Endorsed:) Serial No., 263,998; No. 21. Rejection, dated Jan. 10, 1891.

CHICAGO, ILL., *Jan.* 14, 1891.

Hon. Commissioner of Patents.

SIR: *In re* application Mark D. Knowlton, "box-jointing machine," filed Feb. 14, 1888—serial No., 263,998—

We amend as follows:

Insert in the preamble of the specification acknowledgment of a prior British patent to the same applicant as follows:

D. "Patented in Great Britain on the 5th day of April, 1888, No. 5080."

In the specification, page 18, line 31, erase the words "a mechanism differing materially in its details," and substitute:

D'. "In a machine differing in its details of construction."

Erase claim 3 and substitute the following:

D². "3. The combination with clamping dies having flat faces arranged at an angle with each other, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, a paste or glue applying device for rendering the strip adhesive, and a feeding mechanism for the strip, substantially as described."

Erase claims 6 to 11, both inclusive, and substitute the following:

D³. "6. The combination with clamping dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, and cutters for severing the strip having angular cutting edges, substantially as described.

"7. The combination with clamping dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, of a stationary knife or cutter having angular cutting edges, that one of the said dies which is movable being provided at the ends of its
328 working faces with cutting edges acting in connection with the cutting edges on the said stationary knife or cutter, substantially as described.

"8. The combination with clamping dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, a cutting device for severing the strip having angular cutting edges, and a paste or glue applying device for rendering the strip adhesive, substantially as described.

"9. The combination with clamping dies, of a feeding device embracing a reciprocating carrier and gripping jaws mounted thereon and adapted to engage the said jointing strip, and a paste or glue applying device for rendering the strip adhesive, substantially as described.

"10. The combination with clamping dies, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, a feeding device embracing a reciprocating carrier and gripping jaws thereon, one of which jaws is provided with a narrow edge engaging longitudinally the crease or fold of the strip, and a paste or glue applying device for rendering the strip adhesive, substantially as described.

"11. The combination with clamping dies, of a folder or creasing device operating to fold or crease longitudinally a jointing strip, a feeding device embracing a longitudinally arranged guide-strip having a narrow edge engaging a crease or fold of the jointing strip, a reciprocating carrier and gripping jaws mounted on the carrier, one of said jaws being provided with a narrow edge arranged longitudinally of the jointing strip and engaging the crease or fold of the same, and a paste or glue applying device for rendering the strip adhesive, substantially as described."

Remarks.

Formal amendments have been made as suggested in the office letter. The several claims which were rejected have been amended to include elements not shown in the British patent cited, but which are necessary to constitute a machine for applying adhesive jointing strips, and the claims are now thought to fully avoid the references. A favorable action on the case, as amended, is respectfully urged.

MARK D. KNOWLTON,
By DAYTON, POOLE & BROWN, *Attorneys.*

329 In the United States Patent Office.

In re application M. D. Knowlton. "Box-jointing machine." Filed Feb. 14, 1888. No. 263,998.

Affidavit of M. D. Knowlton.

STATE OF ILLINOIS, }
County of Cook, } ss:

Mark D. Knowlton, being duly sworn, deposes and says that he is the above-named applicant, and that he constructed and put into actual and successful use a machine constructed in accordance with the drawings of said application prior to the 14th day of February, 1888, and that he does not know and does not believe that the invention was in public use or on sale in this country for more than two years prior to his said application, and that he has never abandoned the invention set forth in said application, and further affiant saith not.

MARK D. KNOWLTON.

Subscribed and sworn to before me this the 16th day of January, 1891.

[L. S.] C. CLARENCE POOLE,
Notary Public.

(Endorsed:) United States Patent Office, Jan. 19, 1891. U. S. Patent Office, division XVII, Jan. 19, 1891. Serial No., 263,998; paper No. 22. Amendment D. M. D. Knowlton.

Issue division. Serial No., 263,998.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 13, 1891.

Mark D. Knowlton, care of F. Jannus, asso., city.

SIR: Your APPLICATION for a patent for an IMPROVEMENT IN BOX-JOINTING MACHINES, filed Feb. 14, 1888, has been examined and ALLOWED.

The final fee, TWENTY DOLLARS, must be paid, and the letters patent bear date as of a day not later than SIX MONTHS from the time of this present notice of allowance.

330 If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issue to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of specifications and drawings will be charged for at the following rates: Single copies, uncertified, 25 CENTS EACH. Twenty copies or more, 10 CENTS EACH. The money should accompany the order.

Very respectfully, C. E. MITCHELL,
Commissioner of Patents.

☞ In remitting the final fee give the serial number at the head of this notice.

The within title is that given by the examiner in charge, as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons MUST be given therefor on or before the payment of the final fee.

Memorandum of Fee Paid at U. S. Patent Office.

(Be careful to give correct serial No.)

Serial No., 263,998. 1888.

Inventor:
Mark D. Knowlton.

Patent to be issued to inventor.

Name of invention as allowed:
Box-jointing machines.

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Date of payment:
Feb. 16, 1891.

Fee:
Twenty dollars.

Date of filing:
Feb. 14, 1888.

Date of circular of allowance:
Feb. 13, 1891.

DAYTON, POOLE & BROWN, *Solicitors.*

Send patent to Dayton, Poole & Brown, solicitors of patents, 215 Dearborn street, Chicago.

Serial Number, 263,998. 1888. (Ex'r's Book) 12 170.

Patent No. 447,955.
Mark D. Knowlton,
Of Chicago,
County of ——,
State of Illinois.
Invention: Box-jointing machine.

Parts of application filed.
- Petition, Feb. 14, 1888.
- Affidavit, " " "
- Specification, " " "
- Drawings, 4 sheets, " " "
- Model, not required.
- Specimen, ——.
- First fee, cash, $15, Feb. 14, 1888.
- " " cert., ——.

App. filed complete Feb. 14, 1888.
Examined Feb. 11, 1891. L. M. E. Cooke.
Countersigned: J. W. Babson, for Commissioner.
Feb. 13, '91.
Notice of allowance, Feb. 13, 1891.
Final fee, cash, $20, Feb. 18, 1891.
" " cert., ——, 188–.

1888
Patented in Great Britain April, [1890],* No. 5080.
Patented Mar. 10, 1891.
Attorney or P. O. address, Dayton, Poole & Brown, Chicago, Ills.
Frankland Jannus, asso., Wash., D. C.

332–338 1888.

Contents.

Application, 1 paper[s].*
1. Oct. 24, 1888, rejection.
2. Amend't A, Nov. 12, '88.
3. Dec. 6, '88, rejection.
4. Asso. power of att'y, Dec. 18, '89.
5. Amendment B, Jan'y 21, '89.
6. Feb. 15, 1889, letter.
7. Feb. 15, '89, int. A, with apps. of Inman, Rice and Beach.
8. Feb. 15, '89, int. B, with apps. of Rice, Inman and Jaeger.
9. Apr. 23, '89, judgment against Rice in int. A.
10. May 14, '89, int. A, dissolved as to Rice.
11. Mar. 17, '90, int. decided in favor of Beach.
12. May 1, '90, int. A, ex. of int's affirmed by board.
13. Sept. 10, '90, int. A, board affirmed by Commissioner.
14. Mar. 17, '90, int. B, decided in favor of Knowlton.
15. May 1, '90, int. B, ex. of int's affirmed by board.
16. Sept. 10, '90, int. B, board affirmed by Commissioner.
17. Oct. 9, '90, int. A, dissolved.
18. Oct. 9, '90, " B, "
19. Oct. 9, '90, letter.
20. Amendment C, Dec. 11, '90.
21. Jan. 10, '91, rejection.
22. Amendment D, Jan'y 20, '91.

93. Paper manufacturers. Box machines.

Title: Improvement in box-jointing machines.

(MEMORANDUM.— In the original exhibit here follows a printed Patent Office copy of letters patent No. 11167 (reissue), dated May 26, 1891, granted to Fred H. Beach.)

339 United States Circuit Court, District of Massachusetts. In Equity.

FRED H. BEACH
v.
THE HOBBS MFG. CO. ET AL. } No. 2988.

Fred H. Beach, being duly sworn, deposes and says: I am the complainant in the above-entitled suit and the owner of reissued letters patent No. 11167, dated May 26, 1891, and I am also a member of the firm Knowlton & Beach the manufacturers of the machines set forth and claimed in said reissued patent for staying the

[* Words and figures enclosed in brackets erased in copy.]

corners of paper boxes, and therefore state of my own knowledge that each and every machine made by said firm of Knowlton & Beach, or by others for me under said reissued patent were marked as provided for by section 4900 of the Revised Statutes of the United States, that is to say, by the application of the following letters, words and numerals—" patented May 26, 1891," located upon
340 a conspicuous part or the front of the machine. The reason that the fact of such marking was not set forth in the pleadings and proofs in the cause above entitled, is due to the fact that prior to the decision in the case of Dunlap *v.* Schofield, 152 U. S., p. 248, it had been customary to omit such a statement of facts concerning the marking, etc., and that the pleadings and proofs were all closed in this suit before the decision referred to was rendered.

The records in this case are in the hands of the printer, not yet completed, and as I understand will be held until an order is given either admitting or denying the admission of this statement respecting the said marking, etc.

FRED H. BEACH.

Subscribed and sworn to before me this 17th day of October, 1895.

JOHN DANE, JR.,
[SEAL.] *Notary Public.*

United States Circuit Court, District of Massachusetts. In Equity.

At a stated term of the circuit court of the United States of America, for the district of Massachusetts, in the first circuit, held at the United States court-house at Boston, in said district on the fifth day of November, 1895.

Present: The Honorable Le Baron B. Colt, circuit judge.

FRED H. BEACH
v. } No. 2988.
THE HOBBS MFG. CO. ET AL.

Present: Mr. John Dane, Jr., for complainant, and Mr. Edward S. Beach, for defendants.

Motion being made on the part and in behalf of complain-t for leave to amend his bill of complaint herein for the purpose of showing thereby, that the machines made by and for complainant
341 were, and have been from and ever since the time of the grant and issue of the original patent and the reissue thereof, upon which this suit is based, *have been* properly and conspicuously marked with the dates of the patents, as required by section 4900, and it is therefore, hereby—

Ordered, adjudged and decreed, that the bill of complaint herein be and the same hereby is amended *nunc pro tunc* as of the 3rd day of May, 1892, the date of filing the same, as follows, viz: By adding to the end of the paragraph thereof, which paragraph ends with

the words—"ample facilities for supplying all the demands of the public and of the trade for said invention" ending near the bottom of page 3 of complainant's printed bill of complaint, the following words:

"And that ever since the date of said reissued letters patent as "aforesaid, the plaintiff has put upon the market, and used and "sold machines embodying said invention, which were conspic- "uously marked with, and upon which were fixed the words 'pat- "ented May 26, 1891,' being the date of the said reissued letters "patent, and that the defendants and each of them had actual notice "of the said reissued letters patent at or about the date thereof and "ever since, and continued after such notice to make, use, vend and "dispose of the machines so patented."

And it is also further ordered, that complainant, Mr. Beach, be produced for cross-examination upon his affidavit filed herewith, in case defendant's counsel desires such right and notifies complainant's counsel of such wish within fourteen (14) days next following the date of this order.

By the court:

ALEX. H. TROWBRIDGE, *Clerk.*

342 United States Circuit Court, District of Massachusetts. In Equity.

FRED H. BEACH
v.
THE HOBBS MFG. CO. ET AL. } No. 2988.

Stipulation.

Pursuant to an order of court herein of November 5th, 1895, based upon the granting of complainant's motion, and the affidavit of Fred H. Beach, whereby complainant was granted leave to amend his bill of complaint, therefore, to save time and expense to the respective litigants, it is hereby stipulated and admitted that complainant Fred H. Beach, did properly and conspicuously mark, or caused to be marked, each and every one of the corner-staying machines made by or for him, since the date of the said reissued patent, upon the body thereof, as follows: "Patented May 26, 1891," being the date of the said reissued patent, and in accordance with the statutes for such cases made and provided, and that the defendants and each of them had actual notice of the said reissued patent at, or about the date of its issue, and ever since, and continued after such notice to make, use, and dispose of machines of the kind marked "Complainant's Exhibit Defendants' Infringing Machine," J. A. S., ex'r.

It is also further stipulated that the answer, replication, and all other proceedings heretofore had herein, and all evidence taken or stipulated herein, stand with the same force and effect as if said bill of complaint had originally been filed as amended, and that the said

answer be considered to traverse the allegation contained in said amendment of said bill herein provided.

Dated, New York, November 21st, 1895.

JOHN DANE, Jr.,
Counsel for Compl't.

EDWARD S. BEACH,
Counsel for Def'ts.

343 *Decision of Judge Coxe.*

United States Circuit Court, Northern District of New York. In Equity.

FRED H. BEACH
v.
THE AMERICAN BOX MACHINE COMPANY, HORACE INMAN, ET AL.

On final hearing.

Benjamin F. Lee and John Dane, Jr., for the complainant.
Edmund Wetmore and William A. Redding, for the defendants.

COXE, *J.:*

This action is founded upon reissued letters patent No. 11167, granted to the complainant May 26, 1891, for a machine for attaching stays to the corners of paper or straw-board boxes. The application for the original was filed June 10, 1885. The original, No. 447,225, was dated February 24, 1891. The application for the reissue was filed April 9, 1891. Prior to the invention it had been customary, says the patentee, to apply the fastening strips over the joints at the corners of the boxes, and paste them there, by hand. This work is now done by the patented machine. The claims involved are as follows:

"1. The combination, with opposing clamping dies having diverging working faces of a feeding mechanism constructed to deliver stay strips between said clamping dies, and a pasting mechanism for rendering adhesive the stay strips, and clamping dies being constructed to co-operate in pressing upon interposed box corners the adhesive stay strips, substantially as described.

"2. The combination, with opposing clamping dies having diverging working faces, said clamping dies being arranged to co-operate in pressing adhesive fastening strips upon interposed box corners, a feeding mechanism constructed to feed forward a continuous fastening strip, and a cutter for severing the said continuous strip into stay strips of suitable lengths, substantially as described.

"3. The combination, with opposing clamping dies having
344 diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the dies a continuous fastening strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for

severing the strip into stay strips of suitable lengths, substantially as described.

"4. The combination, with opposing clamping dies having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable plunger or strip-bender constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of the clamping dies which engages the inner surface of the box corner being movable into and out of its usual working position, whereby it may engage and carry inside of the box corner the said projecting end of the stay strip, substantially as described.

"5. The combination, with opposing clamping dies having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable plunger or strip-bender constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of said clamping dies which engages the inner surface of the box corner having a reciprocatory motion in a direction parallel with box corner, so as to carry inward and press against the inside of the box corner the said projecting end of the stay strip, substantially as described.

"7. The combination, with opposing clamping dies having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a feeding mechanism constructed to feed forward a continuous fastening strip, a cutter for severing the strip into suitable lengths, and a movable part or plunger which bends downwardly or inwardly the projecting end of the fastening strip, that one of the clamping dies which engages the inside of the box corner being constructed to reciprocate in a direction parallel with the box corner, substantially as described."

It will be observed that the first, second and third claims cover combinations designed only to cover a stay strip over the joints on the outside corner of the box, while the fourth, fifth and seventh claims cover the additional feature whereby the stay strip is
345 folded over the edge of the box and pasted on the outside as well as the inside of the corner.

The elements of the combination of the first claim are:

First. Opposing clamping dies having diverging working faces and constructed to co-operate in pressing adhesive stay strips upon an interposed box corner.

Second. A feeding mechanism to deliver the stay strips between said clamping dies.

Third. A pasting mechanism for rendering adhesive the stay strip.

The second claim omits the pasting mechanism of the first claim, repeats, substantially, the remaining element of the first claim and adds thereto a cutter for severing the continuous strip into stay strips of suitable length to be applied to the box corner to be stayed.

The third claim is, in substance, a combination of all the eleme of the two preceding claims.

The elements of the combination of the fourth claim are:

First. The opposing clamping dies of the preceding claims.

Second. A movable plunger or strip-bender to bend downwar or inwardly the projecting end of the stay strip.

Third. The anvil die, movable out of and into its usual worki position so that it may engage and carry inside of the box cor the projecting end of the stay strip.

The fifth claim is substantially the same as the fourth, the o difference being that the anvil die is described as having "a recip catory motion in a direction parallel with the box corner."

The seventh claim adds to the combination of the fourth and fi claims the feeding mechanism of the first three claims and the cut of the second and third claims.

The defenses are: Lack of novelty and invention; non-infrin ment of the fourth, fifth and seventh claims; unlawful expansi of claims in the Patent Office by amendment; invalidity of the issue as such, it being the same in all important respects, as t original; and failure to prove infringement, except as to the defe ant, Horace Inman.

The application was nearly six years in the Patent Office. though placed in interference with five different claimants who co tested the complainant's right with unusual pertinacity, he w successful over them all, at every stage of the controversy.

Not content with the adverse decision of the Patent Office offici two of the contestants, one of them a defendant here, soug
346 to have the complainant's patent cancelled and awarded them through the instrumentality of a court of equity. Th were again defeated.

What the machine of the patent does is this: An ordinary past board box is inserted between the clamping dies and it emerges completed box, its corners being stayed by strips which have be pasted to the box on the outside, the projecting end being th neatly folded over and attached to the inside also. The corners the box are adjusted in the dies by the operator—all else is aut matic.

The box thus made is properly shaped, its corners are reinforc and made strong, and much heavier material is used, owing to t greater force which is applied, than is possible in a hand-stay box.

The machine is much more rapid than the hand process; it i creases the production from four to ten fold. It does cheaper, clean stronger, straighter and smoother work than that done by han Less material is used, the boxes are more uniform, artistic a symmetrical, and are delivered from the machine ready for imm diate use.

The Beach machine, or one embodying the principle of his i vention with some minor improvements added, at once beca popular and ousted the hand process and the wire stapling meth in many of the larger establishments. It has taken the mark

become almost indispensable to the trade, and, according to the weight of testimony, has made successful competition well-nigh impossible.

This evidence is objected to because it is said that the machine to which the witnesses chiefly referred was the Knowlton and Beach machine, which contains several patented improvements made by Knowlton. I am convinced that though this machine is an improvement upon the original, it contains the basic idea of the Beach structure, and it is this, and not the subsequent changes, which make it popular.

It would be illogical, in such cases, to attribute success to the non-essential, and not to the essential, features.

Cochrane *v.* Deener, 94 U. S., 780, 787; Mergenthaler Co. *v.* Press Co., 57 Fed. Rep., 502, 505–'6.

But without the proof of the popularity of the machine there is ample evidence in the record to sustain the invention.

347 The inventor does not pretend to be the first who attached stays of paper or muslin to the corners of paper boxes. The patent expressly admits that this had previously been done by hand. He does insist that he was the first to do this by machinery, and asks only for a construction broad enough to prevent others from using his machine, or its equivalent. He asks nothing more.

This statement of the complainant's position disposes of a large number of exhibits offered by the defendants. These would be of value if a construction were sought covering the entire art of box-making, but such is not the case.

The defendants have introduced forty-seven patents showing improvements in machines for making boxes, for inserting wire staples, for flanging boiler plates, for sticking lables and revenue stamps, for bending stiffeners for heels of shoes and for applying shoe-button fasteners. It is conceded by the defendants' expert that none of these anticipates, and, as the counsel for the complainant admitted at the argument that the elements of the combinations, considered separately, were all old, the discussion is narrowed down to the consideration of two or three prior patents only.

As I understand the defendants' position the infringement of the first three claims is not denied. The defense as to these claims is that they are void for lack of patentability.

In approaching this subject it should be remembered at the outset that no one before Beach had attached adhesive staying strips to box corners by machinery. No machines in the box-making art, or any other art, would do this work. Beach was the first to accomplish this result. His was not a broad invention. His operations were confined to the improvement of a single step in the art of making paper boxes. He succeeded, and, in that limited sense, is a pioneer.

The question is, whether in view of what is shown, it required more than mechanical skill to produce the machine of the first three claims. The patent No. 303,992, granted to Dennis and York, August 18, 1884, for improvements in addressing machines, is

unquestionably the defendants' best reference. The improvements relate to machines "in which a strip of paper with the addresses printed thereon is run through the machine, the addresses being cut off in slips and automatically affixed to the newspapes, envelopes, or other articles by a descending knife and platen." The machine has a feeding and pasting mechanism, a vertically reciprocating gate, provided at its lower end with a knife to cut off the
348 addresses, and a platen by which they are carried down and fastened to the newspapers *on* envelopes. The bed on which the papers rest, and which is the only part of the machine which bears the slightest resemblance to the lower die of the Beach patent is called "a follower." Instead of being rigid this "follower" as the name implies, is supported upon light coiled springs and by lever action, so that it will move up and down freely and produce "just enough pressure under all circumstances to receive the pasted slip upon the upper sheet." The impact of the platen and plunger resembles the pat given to a freshly applied postage stamp. Being designed to do this light work the machine is lightly constructed and differs in many minor particulars from the Beach machine.

The defendants insist that a mere mechanic could construct the Beach machine from the Dennis and York machine, and, to illustrate this contention, they have produced a model of the Dennis and York structure so altered that, experimentally, it will, in a crude and awkward way attach stay strips to boxes. The principal alteration is the removal of the platen and follower and the substitution therefor of the clamping dies of the Beach patent, the lower die being firmly fixed, or comparatively so. It is argued that a mechanic could do this. Possibly he might after having seen the Beach machine. But is this a fair criterion? There is hardly a patent that could stand such a test. The question is not whether a mechanic, having seen a box-staying machine, could alter the Dennis & York device into such a machine; not whether a mechanic, if he were told that such a box-staying machine was needed, could construct such a machine, although he had never seen one, from the Dennis and York device.

The question is whether a mechanic, before any one had thought of pasting stay strips to the corners of boxes by machinery, would construct the Beach machine after seeing the labelling machine. Would the latter suggest the idea and the embodiment of the idea? Would the thought enter the mind of the skilled mechanic with the Dennis and York device before him on his work-bench; and if it did, would it not be a creative thought whose presence would convert the mechanic into an inventor?

The language of Mr. Justice Brown, in Topliff *v.* Topliff, 145 U. S., 156, is applicable to the present situation. At page 161 he says: "While it is possible that the Springfield and Surles patent might, by a slight modification, be made to perform the function of equalizing the springs which it was the object of the Augur
349 patent to secure, that was evidently not in the mind of the patentees, and the patent is inoperative for that purpose. Their device evidently approached very near the idea of an equal-

izer, but this idea did not apparently dawn upon them, nor was there anything in their patent which would have suggested it to a mechanic of ordinary intelligence unless he were examining it for that purpose. It is not sufficient to constitute an anticipation that the device relied upon might, by modification, be made to accomplish the function performed by the patent in question, if it were not designed by its maker, nor adapted, nor actually used, for the performance of such functions."

The ability to conceive and carry out such changes as were here necessary is not found in the mere routine plodder, no matter how skillfully he may handle his tools. Mechanics by the hundred had seen the Dennis and York and kindred structures; workmen by the hundred had for years been sticking stay strips to box corners with their hands, and yet no one of them all had hit upon the Beach device. The advantages of a change from hand labor to machinery are obvious, and yet the idea, which is now said to be self-evident, never entered the mind of a single one of this large army of mechanics.

Suppose Beach's machine had never been built, the art, unless some of those who claimed to be prior inventors in the Patent Office had supplied the want, would be in the primitive state that it was before 1885. No other machine could take its place. The fingers of women and children would still be doing work of the "opposing clamping dies." Has not the art been materially advanced by the contribution of Beach? The proposition cannot be maintained that the ingenious mechanism which has revolutionized this branch of the trade is only the product of mechanical skill.

In the defendants' brief the proposition is bluntly stated as follows: "Surely it cannot be contended that the substitution of angular dies for the flat dies of the Dennis and York machine amounts to invention." Of course this is not the question presented by the record, but if it were, the court is by no means certain that the change suggested, considering all that it has accomplished, would not involve invention, even if this were all. Infinitely less were the changes required in substituting a wire barb for one cut from an iron plate; in placing a rubber back upon the packing for stuffing boxes; in substituting a torsional spring for coiled or flat springs in a telegraph key; and in substituting hard rubber, in lieu of
350 materials previously used, for a plate for holding artificial teeth. And, yet, the Supreme Court has decided that to do these things required invention.

Barbed Wire case, 143 U. S., 275; Magowan *v.* Belting Co., 141 U. S.; 332; Electric Co. *v.* La Rue, 139 U. S., 601; Smith *v.* Goodier, 93 U. S., 486.

A very slight alteration in an existing structure will often yield the most astonishing results. If the product of the change is a new combination and a beneficial result never attained before, it is safe to assume that its author is an inventor.

The five applicants, including the active defendant, Horace Inman, who disputes in the Patent Office so vigorously with the com-

plainant for the honor of being the inventor of the patented machine, evidently, at that time, thought something more than mechanical skill was involved. Indeed, the court might almost adopt as its own the language of the defendants in describing the genius and ability necessary to advance the art to its present condition.

A catalogue issued by one of the defendants—American Box Machine Company—contains the following:

"The Inman Manufacturing Co., of Amsterdam, N. Y., recommends to the paper-box manufacturers of this country their new No. 6 corner-stay machine, for staying the corners of boxes and turning the stay in at the same time. The demand for just such a machine is now met. First the wire-stitcher came in and answered the purpose because nothing better could be had. Afterwards we got out the cloth stay machine, which put the stay on the flat surface of the corner. This was a great improvement, but did not meet the full wants and demands of the box-making public. They wanted a machine that would put the stay on the corner, and turn it under same as the old hand method. This was a very difficult thing to do, but we have fully accomplished all—and more than we anticipated."

It is not necessary to examine the other patents introduced by the defendants. If the Dennis and York patent does not invalidate the Beach patent none of the others does. The Orr and Wright patents, Nos. 58466 and 67669, and the Munroe patents, Nos. 244,919 and 298,879, relate to the covering of boxes by winding paper around them. There is nothing in the machines described and shown to suggest the Beach machine. The other patents are still further remote.

351 The foregoing applies with even greater force to the combinations of the fourth, fifth and seventh claims. I am not quite convinced after reading the defendants' brief whether it is contended that these claims are void for lack of invention. The defendants' expert expressly concedes patentability as I understood his deposition. However, it is unnecessary to discuss the matter, as it is manifest that if the first three claims are valid these claims are also valid.

The patent was reissued three months after the original to correct a mistake in one of the drawings. The defendants contend that the law does not permit a reissue to correct inconsequential mistakes. The defense is wholly technical. No one but the patentee was in any way harmed by the reissue. The defense is without merits and does not appeal to a court of equity which should hesitate long before destroying a valuable patent upon a mere abstraction.

No authority is cited to sustain the defendants' theory and it is thought that no tribunal will ever take the harsh and narrow view contended for, certainly this court will not be the first to do so.

It appears from the original patent, assuming it to be properly in evidence, that there was a clear mistake in the drawings. Though this mistake did not render the patent wholly inoperative it was of such a character that a machine constructed in accordance with the

drawings would have been inoperative for some purposes which the inventor was entitled to cover by his claims. It is doubtful whether a mechanic following the drawings would have made the machine which the inventor intended to describe. By the terms of the statute (sec. 4916) it is not necessary that the patent should be wholly inoperative. If inoperative in part it is sufficient. (Hartshorn *v.* Roller Co., 18 Fed. Rep., 90.) This question was submitted to the Commissioner and his decision is entitled to weight and will not be reviewed unless error is manifest from the record.

Machine Co. *v.* Frame, 24 Fed. Rep., 596; Topliff *v.* Topliff, 145 U. S., 156, 171.

There is nothing in the record to overcome the presumption of validity arising from the patent itself.

As I understand the defendants' position regarding the unlawful expansion of the claims it is that the amendment, dated November 7, 1890, was unauthorized and unlawful for the reason that the first three claims were broadened and no new oath was required. The new description and claims are undoubtedly more full and complete than the original, but I cannot find that a new invention is
352 claimed or that the old invention is materially broadened. The only paragraph which introduced new matter was corrected by order of the examiner.

It should be remembered that for years the patentee was powerless to act by reason of the persistent manner in which his right to the invention was contested by others. When at last he had triumphed over all adversaries it is safe to assume that he was a wiser man. He had learned some things during the long controversy. That he was entitled to a patent which fully protected his invention there can be no doubt. If the invention as patented is different from the invention as described in 1885 the court has been unable to discover it.

There can be no dispute that an inventor is entitled so to amend his specification that it will employ perspicuous and artistic language and enable him to hold all that he has invented. This specification does nothing more. In the language of the attorneys who filed the amendment "Care has been used to include nothing in the drawings or specification which was not contained in the same originally filed."

Is there one of the claims that could not have been engrafted on the original description? If so, which one? General accusations are made, but no feature is pointed out which is not found in the original specification. Grant that the description is not so clear, the fact cannot be disputed that every element of the combinations in dispute is found in the first description filed.

There is no doubt about the rule of law laid down in Railway Co. *v.* Sayles, 97 U. S., 554, and the numerous authorities which follow it. The difficulty here is with the facts. If it could be shown that the scope of the original had been enlarged so as to enable Beach to appropriate other inventions the rule would apply. But this has not been shown.

A new oath was not necessary because the amendments introduced no new invention. Nothing in the rules of practice of the Patent Office or the law required it. The grant of the patent is *prima facie* evidence that the necessary conditions precedent were complied with.

Crompton *v.* Mills, 3 Fish, 536; Whittmore *v.* Cutter, 1 Gal., 429; Hartshorn *v.* Roller Co., 18 Fed. Rep., 90, and cases cited. Walker on Patents, sec. 122.

Infringement of the first three claims is practically conceded.
The complainant's expert says regarding these claims that
353 the defendants' machine is a copy of the Beach machine. I do not find this statement anywhere contradicted, except, perhaps, in a qualified way in the testimony taken September 11, 1894, and from the examination which I have given the two machines it certainly seems to be borne out by the facts. The combinations of these claims have, unquestionably, been appropriated.

The rule applicable to the infringement of the other claims is clearly stated by Mr. Justice Blatchferd. He says: "Where an invention is one of a primary character, and the mechanical functions performed by the machine are, as a whole, entirely new, all subsequent machines which employ substantially the same means to accomplish the same result are infringements, although the subsequent machine may contain improvements in the separate mechanisms which go to make up the machine."

Morley Machine Co. *v.* Lancaster, 129 U. S., 263, 273, and cases cited.

In Proctor *v.* Bennis, 36 Ch. Div., 740, Lord Justice Bowen said: "The mere fact that there is an addition, or the mere fact that there is an omission, does not enable you to take the substance of the plaintiff's patent. The question is not whether the addition is material, or whether the omission is material, but whether what has been taken is the substance and essence of the invention."

There is no doubt that the defendants' machine operates to paste the stay on the outside of the box, turn it downwardly and inwardly and paste it on the inside of the corner also. In other words, it does the precise work that the Beach machine does, and it does it by parts so nearly identical that even the experts find it difficult to state, not the differences of form, for these undoubtedly exist, but the differences in function and principle.

The chief points of dissimilarity are, first, the alleged absence of the strip-*hi*nder, and, second, the absence from the lower clamping die of the feature of "being movable into and out of its usual working position." There is a part in the infringing machine which corresponds exactly to the strip-bender and is capable of performing the identical work.

The defendants maintain that when the machine is properly adjusted the strip-bender only operates to press the strip down upon the outer surface of the box corner and that it does not descend below the plane of that surface. The complainant insists, on the

contrary, that, though the machine may be so adjusted, this is not the proper adjustment, not the one which the defendants
354 intended, not the one which a sensible mechanic would adopt. That when the machine is properly adjusted its action in this respect is identical with the Beach machine.

In conformation of the latter contention it may be said that if this part performs no function additional to the pressing action of the upper die it is not easy to understand why it was placed in the machine at all. But even if the defendants are right upon this point there can be no doubt that the part in question forces, or bends, the projecting end of the stay strip downwardly. It can bend it in no other direction. True, it does not bend it down as far as the Beach strip-bender, but it does bend it far enough, so that it is caught by the reciprocating lower die, or tucking finger, and carried inside the box corner.

The defendants' strip-bender may do less work and their tucking finger more work than the complainant's, but it is perfectly plain that the two parts together perform the identical work that the corresponding parts perform in the Beach machine. Their action may not be synchronal; there may be structural differences; the defendants may have introduced improvements, and yet the fact stands out clear and indisputable, that the defendants' machine does the same work as the complainant's machine, if not by the same, certainly by equivalent means.

Assuming that the complainant needs to invoke the doctrine of equivalents, surely it is not carrying that doctrine too far to hold the defendants' device an infringement when it is remembered that no one pretends that the machine of the fourth, fifth and seventh claims ever existed before. "The range of equivalents depends upon the extent and nature of the invention."

Miller *v.* Eagle Co., 151 U. S., 186–207.

As to the other point, it is true that the lower clamping die, as a whole, does not, in the defendants' structure, move out of and into its usual working position. The lower die is divided; about half thereof remains stationary and the other half moves into and out of its usual position, or reciprocates in a direction parallel with the box corner, accomplishing the same result as the lower die in the Beach machine. The operation of the two is somewhat different. The Beach tucker moves on right lines while the defendants' tucker swings, for a time, in the arc of a circle, but when it does its work it moves in the same way, substantially, as the Beach tucker. The differences are immaterial. The defendants' mechanism per-
355 forms the same labor and accomplishes the same result in substantially the same way as the complainant's mechanism. The former is the equivalent of the latter. Patents would be of little value if they can be avoided by such changes.

Machine Co. *v.* Murphy, 97 U. S., 120, 125; Cantrell *v.* Wallick, 117 U. S., 689; Winans *v.* Dennead, 15 How., 330; Sargent *v.* Larned, 2 Curt., 340.

The law does not intend that one who has taken the invention in its entirety, who has appropriated the inventor's idea and the broad principle on which the structure operates which embodies that idea, shall escape infringement because he practices the invention in a slightly different form from that shown in the patent. The law, in such cases, deals with substance and not with form; it tears the disguise from the infringer and exhibits him in his true light. To adopt the language of Mr. Justice Grier in Blanchard *v.* Reeves, 1 Fish, 103, "It is true that complainant's specification describes a machine, which effects its result by a combination of lateral and rotary motion, to form a helical course or track in the operation of the machine. But is that of the essence or substance of the invention? or is it not merely an accident of that particular form of the machine described? * * * We cannot shut our eyes to the fact that the defendants have pirated the invention of the complainant in all its essential parts."

As there is no proof of infringement by the American Box Machine Company the bill must be dismissed as to it.

The other defendants are sued as copartners, trading under the name of the Inman Manufacturing Company and as this copartnership is admitted in the answer and as a sale by one of the partners is established, it would seem that the proof as to them and the copartnership is sufficient.

It follows that the complain t is entitled to the usual degree as to all the defendants, except the American Box Machine Company. The question of costs can be determined upon the settlement of the decree.

356 *Decision of the Circuit Court of Appeals.*

United States Circuit Court of Appeals, Second Circuit.

FRED H. BEACH, Complainant and Appellee,
v.
THE INMAN MANUFACTURING COMPANY and Others, Defendants and Appellants.

Before Judges Wallace, Lacombe, and Shipman.

Mr. Edmund Wetmore, W. A. Redding, and A. W. Kiddle, for defendants and appellants.

Mr. John Dane, Jr., for complainant and appellee.

This is an appeal from an interlocutory decree of the circuit court, northern district of New York, November 13, 1894, enjoining defendants-appellants Horace Inman, John Warner, and A. A. De Forrest, trading together as copartners under the name of "Inman Manufacturing Company," from infringing claims 1, 2, 3, 4, 5 and 7 of complainant's patent, reissue No. 11167, dated May 26, 1891, for "Improvements in machines for attaching stays to the corners of boxes."

LACOMBE, *Circuit Judge:*

The complainant, who is the inventor, filed his application June 10, 1885. Interference in the Patent Office delayed the issue of the patent (No. 447,225) until February 24, 1891. The reissue No. 11167, May 26, 1891, differs from the original only by the correction of an error in the drawings.

The specification states that:

"It has been customary heretofore in making paper or straw-board boxes to apply a stay or fastening strip over the joints at the corners of boxes, which strip is pasted down on the outside of the box or is folded over the edge of the box, and is secured by paste
357 both outside and inside of the corner, and such work, as far as I am aware, has heretofore been done by hand. My invention relates to a machine for doing this work." The specification then goes on to describe the machine in connection with the drawings. Its essential features are as follows: To a frame of suitable form there is affixed a block B, having two oblique faces on its upper surface, upon which the inside of the corner of the box is to be placed. Above this block B there is located a vertically reciprocating plunger G, with a die at its end having divergent faces, so arranged as to engage surface to surface with the divergent faces of the block when the plunger descends. Thus when in operation the block fits into the inside of the box corner, and the plunger die fits over the outside of the same. Suitable shafting, cams, guides, etc., to supply and regulate the motion of the various parts are described. The stay strip, which is paper or cloth of a proper width wrapped in a continuous roll upon a reel located to the side of the block and plunger, is fed forward and over a pasting wheel. The forward end of the roll of stay strip, after passing the pasting machanism, protrudes transversely to the box corner, over said corner, and at or about the time when the plunger descends a cutting mechanism shears off the end of the strip, so as to leave a sufficient length of stay strip upon the box corner subject to the action of the affixing mechanism. When this short stay strip is thus placed over the outside of the box corner the engagement of block and plunger die, with the box corner interposed between, applies the pressure necessary to secure such stay strip in place. In the drawings the block and die are shown with faces diverging to enclose an angle of 90°, and are thus adapted to fit the rectangular corner of a four-sided box. They are not, however, restricted to this precise shape, and the divergence of the faces may be changed to meet the varying angles which would be found in boxes with three sides, or with more than four sides, and still be clearly within the patent. The mechanism to fold the strip over the edge of the box and affix it to the inside of the corner is fully described. The block B is shown in section thus:

It is of sufficient length to accommodate the width of stay strip to be affixed. The square-sided block B is firmly fixed in the frame A, so that its upwardly projecting portion displays two diverging surfaces of the proper angle to fit inside the box corner. B, of

course, projects forward of the frame A, so as to allow the operator to place the box corner on the block, without obstruction by
358 the frame. In its top is cut a V-shaped notch *b*, into which fits the square-sided angle I. When the anvil is in place the block and anvil fill the entire inside of the corner. When the anvil is withdrawn so much of the inside surfaces of the box as are next the corner are free from contact with block or anvil, and an unobstructed space is left sufficient to accommodate the tucked-in part of the stay strip. The rest of the inside surfaces are still supported by the block. In operation the box corner is so placed upon the block that when the cut-off stay strip falls upon it a portion of the stay strip projects inwardly beyond the edges of the two box sides which make up the corner. In the rear of plunger G, which, it will be remembered, falls upon the outside surfaces of the box corner, there is a secondary plunger reciprocating vertically, and synchronously with plunger G. This secondary plunger falls, not upon the box, but on the inwardly projecting portion of the stay strip and bends it down. Before these plungers fall the anvil I has been moved out of the V-shaped notch in block B, it slides backward and entirely off from the block. As soon as the secondary plunger has bent down the projecting portion of the stay strip so that it hangs in front of the entrance to the empty V-shaped notch, the anvil I moves forward again into place, and meeting on its way the downwardly hanging free edge of stay strip pushes it forward into the inside of the box corner, smoothing it down as would the finger of an operator, and when the anvil I is once again in place, and both inside and outside of the box corner wholly in contact with the diverging faces of anvil block and plunger die, a final squeeze fixes the short pasted stay strip firmly in place.

After a full description of the several parts of the machine and their mode of operation—the above is a mere brief epitome of such description—the inventor proceeds: "In many boxes the stay is simply pasted against the exterior surface of the box corner and is not turned in or over the edge of the same, in which case the work can be done by using a non-reciprocating angular lower die or anvil and a single upper die or plunger. In such case the form B will obviously not be necessary as a part separate from the die; or, in other words, a single lower die or form will take the place of the form B and movable lower die I."

"In some cases a continuous stay strip may be employed, which is covered or coated with dry adhesive material, in which case water will be used in the receptacle J, and the roller O will operate to moisten the strip only.

359 "As far as the main features of my invention are concerned, forms other than those illustrated of the several parts of the machine may be employed without departure from my invention—as, for instance, in place of the particular mechanisms shown for feeding or delivering fastening strips or stay strips to and between the clamping dies or for applying paste or glue to the said stay strips—other forms of strip feeding and pasting devices may be used in practice, with the same general result as above described."

The claims relied on are these:

1. "The combination, with opposing clamping dies having diverging working faces, of a feeding mechanism constructed to deliver stay strips between said clamping dies, and a pasting mechanism for rendering adhesive the stay strips, said clamping dies being constructed to co-operate in pressing upon interposed box corners the adhesive stay strips, substantially as described."

2. "The combination, with opposing clamping dies having diverging working faces, said clamping dies being arranged to co-operate in pressing adhesive fastening strips upon interposed box corners, a feeding mechanism constructed to feed forward a continuous fastening strip, and a cutter for severing the said continuous strip into stay strips of suitable lengths, substantially as described."

3. "The combination, with opposing clamping dies having diverging working faces, and said clamping dies being arranged to co operate in pressing an adhesive fastening strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the dies a continuous fastening strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strip into stay strips of suitable lengths, substantially as described."

4. "The combination, with opposing clamping dies having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a movable plunger or strip-bender constructed to bend downwardly or inwardly a projecting end of the stay strip, that one of the clamping dies which engages the inner surface of the box corner being movable into and out of its usual working position, whereby it may engage and carry inside of the box corner the said projecting end of the stay strip, substantially as described."

5. "The combination, with opposing clamping dies having diverging working faces, said clamping dies being constructed to co-operate in pressing an adhesive fastening strip upon an interposed
360 box corner, of a movable plunger or strip-bender constructed to bend downward or inwardly a projecting end of the stay strip, that one of said clamping dies which engages the inner surface of the box corner having a reciprocating motion in a direction parallel with the box corner, so as to carry inward and press against the inside of the box corner the said projecting end of the stay strip, substantially as described."

7. "The combination, with opposing clamping dies having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon an interposed box corner, of a feeding mechanism constructed to feed forward a continuous fastening strip, a cutter for severing the strip into suitable lengths, and a movable part or plunger which bends downwardly or inwardly the projecting end of the fastening strip, that one of the clamping dies which engages the inside of the box corner being constructed to reciprocate in a direction parallel with the box corner, substantially as described."

These six claims cover two distinct sets of combinations, the first

set including the combinations of claims 1, 2 and 3, which contain no turning-in features and contemplate only the affixing of the stay strip to the outside of the box corner, and the second set including the combinations of claims 4, 5, and 7, which have the same combinations of claims 1, 2 and 3, with the added element of the turning-in feature, and contemplate the affixing of the stay strip to both the outside and the inside of the box corner. The elements of the first claim are the opposing clamping dies, the feeding mechanism, and the pasting mechanism. The second claim omits the pasting mechanism, and adds the cutting mechanism. The third claim is substantially a combination of all the elements of the first and second.'

The first three claims are broad ones, covering the particular combinations referred to without any restriction to the details of mechanical construction, and defendants concede that, if these claims are to be sustained broadly as they are expressed, they are infringed. As to this first set, therefore, the only question is whether in view of the state of the art, Beach was entitled to appropriate as broad a combination as he has set forth in his first three claims, which cover every device for affixing stay strips to the outside of box corners, where the operation is performed by the combined action of a feeding mechanism, a cutting mechanism, and a pasting mechanism, in combination with any opposing clamping dies whose faces diverge.

361 The circuit court sustained these broad claims, and we concur in this decision. It is hardly necessary to add anything to the elaborate discussion of this part of the case, which will be found in the opinion of the learned judge who heard it in the circuit court. The patentee indisputably made a machine which did work that theretofore was always done by hand. It is undoubtedly true that paper strips had theretofore been applied to boxes by machinery. (See Orr and Wright's patents, and also Inman and Monroe's.) And the strips thus applied did to a greater or less extent operate to stay the corners. They completely surrounded the boxes to which they were applied, and the machines are spoken of in the record as covering machines; they wound the strip of adhesive paper around the box, pressing it on and turning over the edge when necessary, by means of a roller. But despite the existence of the covering machines, paper-box makers still continue to apply shorter strips to the corners as an additional stay to the box. Horace Inman, one of the defendants, who was in interference with the patentee, claiming to have himself first made the invention, testified in such interference proceeding:

"I got my covering machine running, and found that I needed a machine for setting the corners of boxes, as the cover needed to be set up more square and true to be covered by the machine than it did to be covered by hand; the paper being put on by hand in short pieces, could be adjusted to the unequal corners of hand setting up better than long continuous pieces away around the box could be, as it was in the case of machine work. By 'setting up' I mean the corner stay-work."

Certainly the state of the art exhibits a necessary part of the work of box-making as done by hand with no machine existing in the art to do it. That machine the complainant was the first to supply. Moreover, the evidence leaves no doubt that it did the work it was devised to do. Subsequent improvements have made it do that work better, have made it practicable to apply stay strips to more varieties of boxes than Beach's original machine could readily handle; but that is immaterial when it is shown, as it has been here, that machines made in strict conformity to the patent have been used by manufacturers for years in doing this very work of applying short stay strips, and to the satisfaction of the users.

So far as the record shows, no machine presenting the complete combination of the first three claims existed before Beach's invention, either in this art or any other. The nearest approach
362 to it is the Dennis & Yorke machine, which pastes address labels on folded newspapers. That has feed, pasting and cutting mechanism combined with a vertically reciprocating plunger descending with a flat head on a flat platen, the newspaper being interposed between. This is quite a close approach to the machine of the patent. It is only necessary to change the flat head and the flat platen to clamping dies with diverging faces, and to make the machine stronger in order to enable it to fasten stay strips to box covers. That is shown by the old Dennis & Yorke machine in evidence, which has been thus altered and does such work. If this Dennis & Yorke machine were already in the box-maker's art; if some one prior to Beach had cut away part of its framework, had made its flat platen rigid and increased its power and employed it to affix adhesive labels to the tops or sides of boxes, it might not be invention merely to change the shape of the dies so as to fit into and over box corners and there apply adhesive strips. But no one had done this; the Dennis & Yorke machine was not in this prior art, and when Beach took it from another art, where it was doing different work, and by modification adapted it to efficient use in his own art and thereby gave to his own art the first machine it ever had which could do work necessary to be done, and always theretofore done by hand, he made an invention to the fruits of which he should be entitled.

No question as to the effect of the reissue was argued in this court; it is unnecessary, therefore, to add anything to the opinion of the circuit court on that point. Nor does the contention of the defendants that there has been some broadening or expansion of the first three claims during the long period of time that the patentee was in interference call for any extended discussion. When Beach first applied for a patent, in June, 1885, he described his entire machine, and each of the claims he submitted then covered the devices for turning in the end of the stay strip under the edge of the box. He filed amendments in May, 1886, in which he added to the specification the statement that where the stay is to be simply pasted down over the corner of the box and is not to be turned under, the work can be done by his machine by using the angular form and one plunger with a corresponding angular notch. This was self-evident

on the original specification and drawings, and the statement thus added to the specification described no new or enlarged invention. The original drawings and specifications suggest the claims finally made, which recognize and claim the two different operations of outside and inside application.

363 The second set of claims, Nos. 4, 5 and 7, are restricted to the combination already described for affixing the stay strip to the outside with the addition of the devices for turning in the end of the strip. The appellants contend that these claims should be closely confined to the particular turning-in device shown and described, and that these claims should not be construed to cover any construction which does not employ the lower clamping die as a means of fastening the stay strip upon the inside of the box corner, nor to cover any machine in which the lower clamping die does not perform the "dual function of pressing the stay strip against the inside of the box corner, in addition to the function of supporting the box corner while the stay strip is being pressed upon the outside of the box corner." They contend that said claims must not be restricted to a lower die "which is so constructed that it will operate with the other parts of the machine at one time, in its usual working position, to support the box corner under the pressure of the plunger, and at another time (having first been withdrawn from under the box corner) it will move outward again into the notch of the form and complete the square of the form and fasten the strip upon the inside of the box corner." It is unnecessary to discuss this contention, for, with all the restrictions thus insisted on, these claims cover defendants' device. Instead of withdrawing the whole of the anvil I, defendants withdraw only such portion of it as will leave sufficient space for the end of the strip to be turned in. The rest of the anvil is rigid, being part of the block itself. When the movable part is in place, it and the rigid part together make up the anvil of the patent and discharge the same functions of support and pressure. This movable part of the anvil defendant connects with his plunger by a shaft, the shaft and movable portion of the anvil together being described in the record quite aptly as a tucking finger. When it is withdrawn from the notch it swings back in the arc of a circle, but when after being withdrawn it again advances to the notch it moves, as the model shows, in precisely the same direction as does the horizontally reciprocating anvil of the patent. Indeed, it is apparent that it must so move, or it would not properly smooth down the paper into place.

It is only while it is moving into position, or is resting in place, that it is doing any work, and since it does that work in the same way and in the same line of motion as the device of the patent, it is immaterial that when it is not doing work it moves in a different way and is differently actuated.

364 The defendants' machine has a secondary plunger adapted to do the same work as complainant's secondary plunger, and in precisely the same way. No doubt when the box corner is placed on the lower die in one way this secondary plunger will hit upon the box instead of on the projecting edge of the strip, but it is just

as easy to place the box corner on the lower die so that the secondary plunger will fall upon and bend down the projecting edge, and it may well be assumed that such will be the ordinary mode of using it. The variations from complainant's turning-in device are too trivial to avoid infringement of the fourth, fifth and seventh claims.

Infringement by the defendants, Horace Inman, John Warner and A. A. De Forest, composing the Inman Manufacturing Company, is sufficiently shown in the record before this court. A machine known as No. 308 was sold by Inman, November 10, 1892. It is substantially of the same structure as the model, which was before the experts when the proofs were taken, and it equally infringes the claims of the patent. The appellants say that this (No. 308) is a so-called Jaeger machine. There is uncontradicted evidence in the case that the Jaeger machine and the Inman machine are one and the same thing, and defendants Horace Inman and the Inman Manufacturing Company expressly admit in the eleventh paragraph of the answer that they have made and sold and are making and selling Jaeger machines.

The contention of the appellants that there is no proof that complainant gave public notice of his patent by marking his machines relates only to the question of damages, and that is not before us on this appeal.

The decree of the circuit court is affirmed with costs.

(Endorsed:) United States circuit court of appeals, second circuit. Fred H. Beach *vs.* The Inman Manufacturing Company and others. Opinion. Lacombe, J. United States circuit court of appeals, second circuit. Filed December 2, 1895. James C. Reed, clerk.

364*a* DEFENDANTS' EXHIBIT CERTIFICATE AS TO JAEGER LAPSED PATENT.

(Put in evidence, page 223.)

Certificate of Vice and Deputy Consul General as to Signature of Comptroller General of Patents.

Consulate general of the United States of America for Great Britain and Ireland, at London.

I, John J. Collins, vice and deputy consul general of the United States of America for Great Britain and Ireland, at London, do hereby make known and certify to all whom it may concern, that the signature "H. Reader Lack" subscribed to the annexed certificate is of the true and proper handwriting of Sir Henry Reader Lack, comptroller general of patents, designs, and trade-marks, London, England, and that to all acts signed as the annexed full faith and credit are and ought to be given in judicature and thereout.

In testimony whereof, I have hereunto set my hand and affixed the seal of the consulate general of the United States, at London, aforesaid, this fifteenth day of September, 1894.

[SEAL.] JOHN J. COLLINS,
Vice and Deputy Consul General.

Certificate of Comptroller General of Patents as to Expiration of Patent No. 5073 of 1888 for Non-payment of Fees.

Patents, designs, and trade-marks acts, 1883 to 1888.

Form Q.

Certificate of comptroller general.

Patent
Royal Courts of Justice
A 18 Five 8
Shillings
94

PATENT OFFICE, LONDON, *Aug.* 20, 1894.

I, Henry Reader Lack, comptroller general of patents, designs, and trade-marks, hereby certify that the patent No. 5073 of
364*b* 1888, granted to Alexander Henry Reed (a communication from Gustav Ludwig Jaeger), expired on the 5th April, 1892, through non-payment of the fourth year's renewal fee.

H. READER LACK.

To Messrs. D. Young & Co., 11 & 12 Southampton buildings.

364*c* United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

Certificate of Clerk to Volume I, Pleadings and Evidence.

UNITED STATES OF AMERICA, *First Judicial Circuit,* } *ss:*

I, John G. Stetson, clerk of the United States circuit court of appeals for the first circuit, certify that the foregoing printed pages, 1 to 364, inclusive, contain and are a true copy of volume I, pleadings and evidence, in a cause pending in the circuit court of the United States for the district of Massachusetts, entitled Fred H. Beach, complainant, *v.* Clarence W. Hobbs *et al.*, defendants, as said pleadings and evidence were transmitted to the United States circuit court of appeals for the first circuit as a part of the record of said circuit court in said cause upon the appeal of the said complainant from an interlocutory decree of said circuit court in said cause to said United States circuit court of appeals for the first circuit.

I further certify that this volume I is the volume referred to as volume I in my final certificate, bearing even date herewith, contained in volume IV of the record and all proceedings in this case, page 683.

Seal United States Circuit Court of Appeals, First Circuit.

364*d* In testimony whereof I hereunto set my hand and affix the seal of said United States circuit court of appeals for the first circuit, at Boston, in said first circuit, this twentieth day of July, A. D. 1899.

JOHN G. STETSON, *Clerk.*

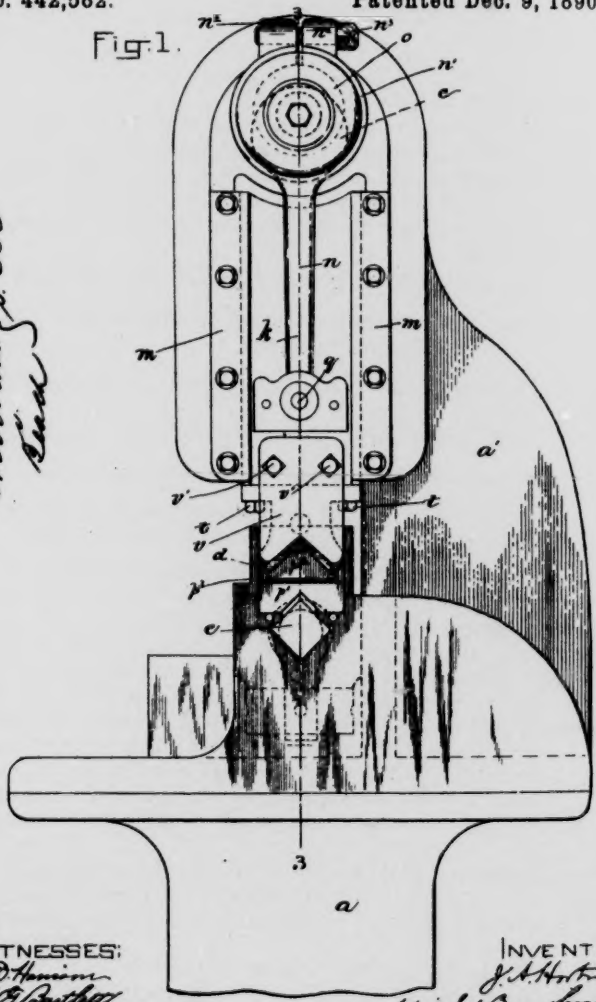
(No Model.) 5 Sheets—Sheet 1.

J. A. HORTON:

BOX STAY MACHINE.

No. 442,582. Patented Dec. 9, 1890.

Fig. 1.



No. 139. Horton Pat. p. 366

WITNESSES:
A. D. Hamison
C. E. Smith

INVENTOR:
J. A. Horton
by Wright Brown Quinby & Atty.

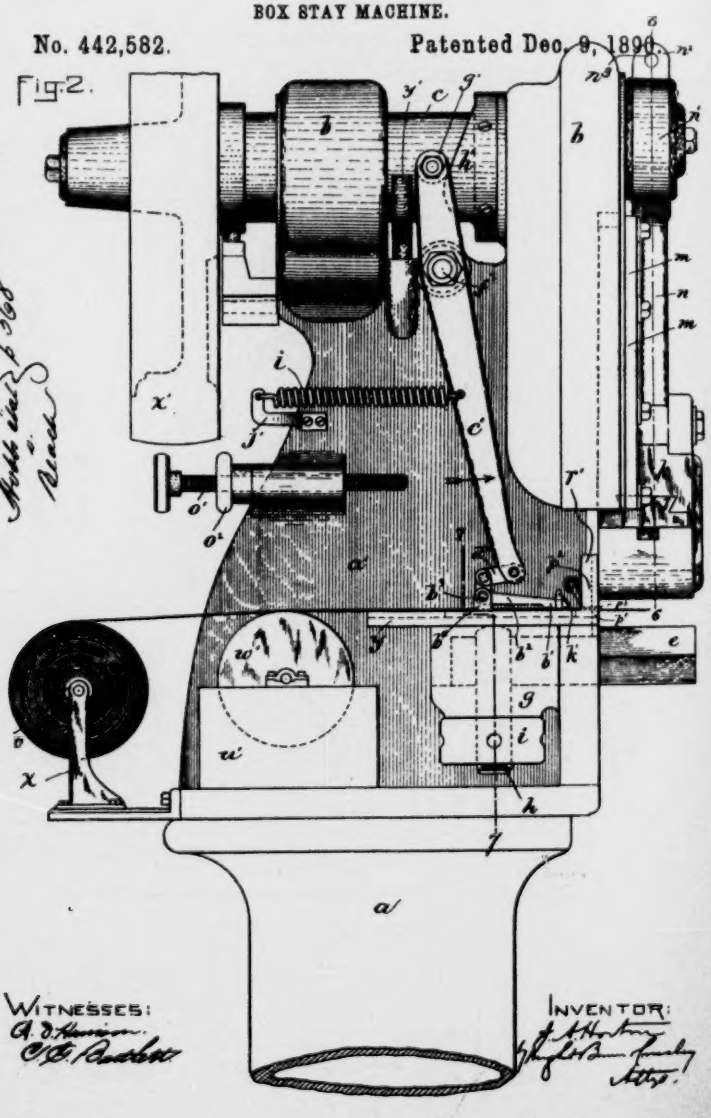
(No Model.) 5 Sheets—Sheet 2.

J. A. HORTON.

BOX STAY MACHINE.

No. 442,582. Patented Dec. 9, 1890.

Fig. 2.



WITNESSES:

INVENTOR:

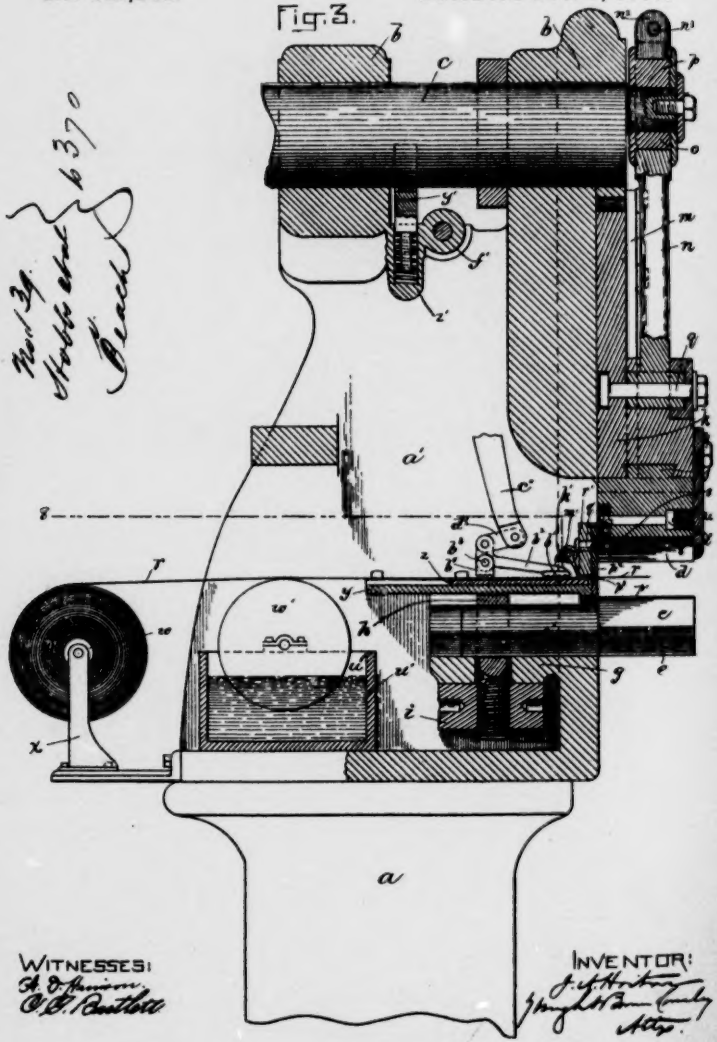
(No Model.) 3 Sheets—Sheet 3.

J. A. HORTON.

BOX STAY MACHINE.

No. 442,582. Patented Dec. 9, 1890.

Fig. 3.



16556

(No Model.) 5 Sheets—Sheet 4.

J. A. HORTON.

BOX STAY MACHINE.

No. 442,582. Patented Dec. 9, 1890.

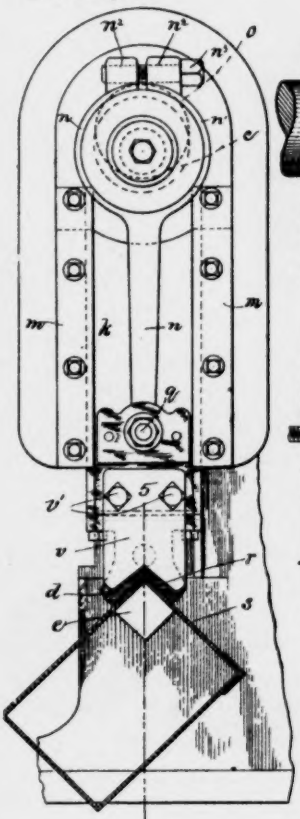


Fig. 4.

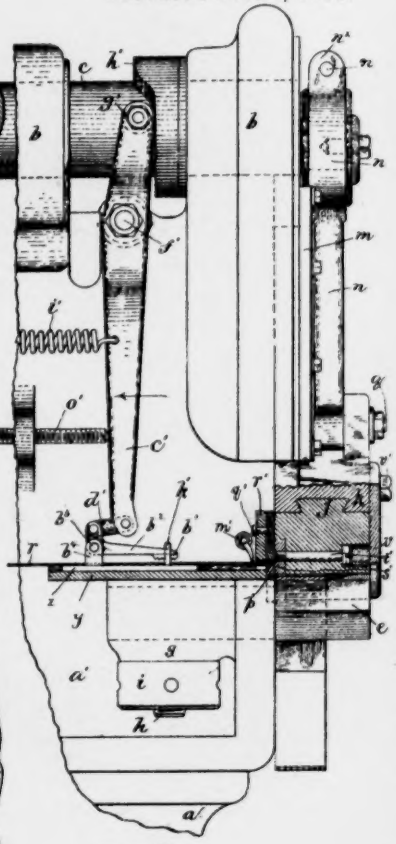


Fig. 5

WITNESSES:
C. D. Hamm.
C. F. Barthold

INVENTOR:
J. A. Horton
by Wright Brown Quinby & Coulby
Attys.

No. 139 Stockbridge Ave. 372
Cleveland

(No Model.) 5 Sheets—Sheet 5.

J. A. HORTON.

BOX STAY MACHINE.

No. 442,582. Patented Dec. 9, 1890.

Fig. 6.

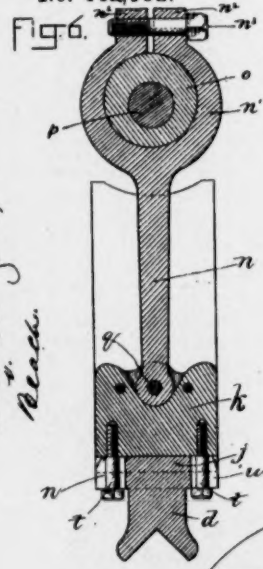


Fig. 7.

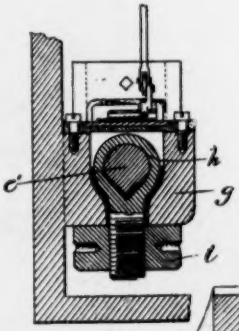
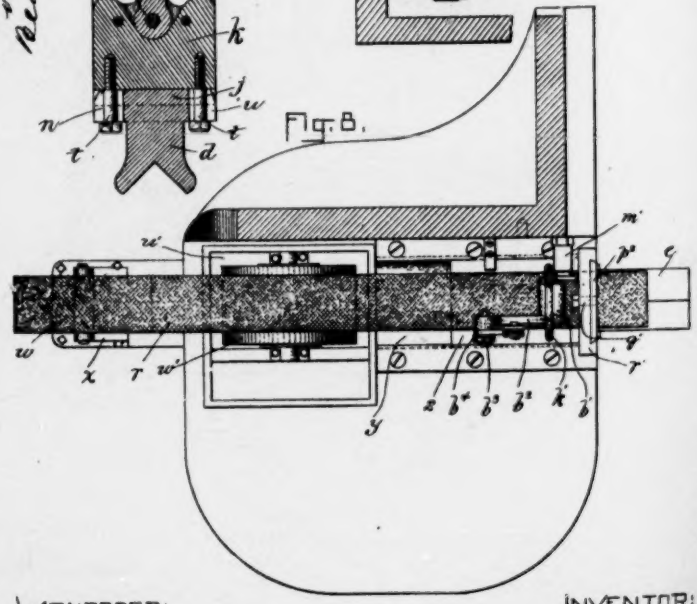


Fig. 8.



WITNESSES:
A. D. Harrison
C. E. Radcliff

INVENTOR:
J. A. Horton

375 UNITED STATES PATENT OFFICE.

JAMES A. HORTON, of Reading, Massachusetts.

Box-stay Machine.

Specification forming part of letters patent No. 442,582, dated December 9, 1890. Application filed March 28, 1890. Serial No. 345,710. (No model.)

To all whom it may concern:

Be it known that I, James A. Horton, of Reading, in the county of Middlesex and State of Massachusetts, have invented certain new and useful improvements in box-stay machines, of which the following is a specification.

This invention relates to that class of machines for applying stays to the corners of boxes and box-covers, in which a rectangular mandrel is employed to support the box or cover internally, while a reciprocating plunger having a re-entrant angle in its operating-face descends and bends the stay into angular form and presses it upon the corner of the box body or cover while the same is supported by the mandrel.

The invention has for its object to provide a simple, efficient, and rapidly-operating machine of this class; and it consists in the several improvements which I will now proceed to describe and claim.

(Here follow diagrams marked pp. 366, 368, 370, 372, & 374.)

In the accompanying drawings, forming a part of this specification, figure 1 represents a front elevation of a box-staying machine embodying my improvement. Fig. 2 represents a side elevation of the same. Fig. 3 represents a section on line 3 3, Fig. 1. Fig. 4 represents a front elevation showing the stay-forming plunger depressed and in the operation of conforming the stay to the corner of the box. Fig. 5 represents a vertical section on line 5 5, Fig. 4, and a side elevation of that portion of the machine which is above said line. Fig. 6 represents a section on line 6 6, Fig. 2. Fig. 7 represents a section on line 7 7, Fig. 2, looking toward the right. Fig. 8 represents a horizontal section on line 8 8, Fig. 3, and a plan view of the parts of the machine below said line.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a supporting-pedestal, and *a'* a head or frame supported thereby, said head having bearings *b b* for the driving-shaft *c*, that gives motion, through the devices presently described, to the stay-former or plunger *d*.

e represents the mandrel or former, which is made square or rectangular in cross-section, and is provided with a shank *e'*, which rests on a seat or bearing *g*, formed on the head *a'*, and is secured

to said bearing by a clamp h, which is formed, as best shown in Figs. 3 and 7, to surround the shank e', its lower portion being screw-threaded and passing through an orifice in the seat g, and provided below said seat with a binding-nut i, which when turned to a bearing on the under side of the seat g presses the clamp down upon the shank e' and causes said clamp to securely hold the shank and the mandrel formed thereon in any desired position, the mandrel being thus adapted to project more or less from the front of the head a', according to the depths of the box or box-cover which it is to support.

The plunger or former d is a block of metal having a dovetailed rib j on its upper side, which is inserted in a corresponding groove in a cross-head k, which is fitted to slide vertically between guides m m on the head or frame a'.

n represents a connecting-rod having its upper end formed as a strap or band n', which is split at its upper portion, as shown in Fig. 2, and there provided with ears n^2 n^2, which are connected by bolt n^3. The strap n surrounds an eccentric o, which is loosely mounted on an eccentric wrist-pin p on one end of the driving-shaft c. The lower end of the rod n is connected by a bolt or pivot q with the cross-head k. The rotation of the shaft c causes the wrist-pin p, through the rod n, to reciprocate the cross-head k and former or plunger d. The object of the eccentric o is to regulate the height of the former d when the latter is at the lowest extreme of its movement, and thereby enable the plunger to be adjusted to the thickness of the box material on the mandrel e, said adjustment being effected by loosening the bolt n^3, so that the eccentric o can be freely rotated in the strap n' until the desired adjustment of the former d is effected, and then tightening said bolt, so as to clamp the strap n' securely upon the eccentric o, and thus practically make said strap and eccentric one.

The former d has its lower or acting face formed as a re-entrant angle, as shown in Figs. 1, 4, and 6, to fit the box-supporting faces of the mandrel, the arrangement being such that when the former is depressed it bends the stay-strip r into angular form and
376 presses it upon the corner of the box s, as shown in Fig. 4. The said former d is secured to the cross-head k by means of screws t t, Fig. 6, passing through horizontal slots u u in the upper portion of the former. Said slots and screws, together with the connection afforded by the dovetailed rib j on the former and the groove receiving the same in the cross-head, enable the former to be adjusted horizontally, so that the angle formed by the two sides of its operating-face can be located directly over the salient angle of the mandrel, as it should be when the two sides of the box supported by the mandrel are of equal thickness, or at one side of said salient angle, as it should be when one side of the box is thicker than the adjoining side, as is often the case in consequence of the overlapping of one side of the box upon the adjoining side.

To prevent the possibility of the former working loose or wabbling, I attach to the cross-head k by means of screws v' v' a plate v, which

is formed to bear upon the outer side of the former and hold it steadily in position.

The stay-strip r is wound in a roll upon a spool w, which is mounted to rotate in bearings in standards x, affixed to the frame of the machine.

y represents a table or guide, over which the strip r passes from the spool to the mandrel.

z represents a slide, which is mounted to move horizontally on the guide or table y, its upper surface constituting a bed or support on which the strip r bears.

b' represents a feed-dog or foot, which is formed on a lever b^2, pivoted at b^3 on an ear b^4, formed on the slide z.

c' represents a lever, which is pivoted at f' to the supporting-frame, and is connected at its lower end by a link d' to the lever b^2. At the upper end of the lever c' is a trundle-roll g', which bears on a cam h', attached to the shaft c. A spring i' attached at one end to a bracket j' on the supporting-frame and at the other end to the lever c', holds the upper end of said lever in yielding contact with the cam h'. The rotation of the cam h' oscillates the lever c', causing it to move in the direction indicated by the arrow in Fig. 2. When the lever c' is moving in the direction indicated in Fig. 2, it presses the feed-dog b' down upon the strip r and at the same time moves the slide z in the same direction. The strip r being clamped between the dog b' and the slide z, is therefore moved in the same direction as the lever c', the strip being thus fed outwardly over the mandrel e. When the lever c' is moving in the opposite direction, as indicated in Fig. 5, it raises the dog b' from the strip as far as a loop or guard k', secured to the plate z, and extending across the dog will permit said guard being formed to permit the dog to be raised out of contact with the strip r and to arrest the dog in its upward movement, thus holding the lever b^2 so that the lever c' can, acting through the link d' and lever b^2, push the slide z backwardly, or in the direction indicated by the arrow in Fig. 5.

m' represents a loose dog, which is pivoted to the frame of the machine, and is arranged to engage the strip r during the backward movement of the slide y and prevent said strip from being carried backwardly by the slide, said dog m' yielding when the strip is moved in the opposite direction.

o' represents an adjustable screw mounted in an ear on the frame a' and arranged to serve as a stop to limit the backward movement of the lever c', thus determining the length of the feed movement imparted to the strip r by the movements of said lever. The screw o' is provided with a check-nut o^2 to secure it in any position to which it may be adjusted.

p' represents a fixed shear-blade of hardened steel attached to one end of the table or guide y and arranged flush with the upper surface of the slide z, so that the strip r in being fed forward moves across and bears on the blade p', as shown in Fig. 3. Above said blade is a plate p^2, which is separated from the blade by a narrow slot p^3, as shown in Figs. 1 and 2. The object of said plate p^2 is to guide the strip r and confine it against lateral or vertical movement.

Said plate p^2 may be a part of the fixed blade p', if preferred; but as the blade p' requires renewal on account of the wear to which it is subjected I prefer to make it in a separate piece from the plate p^2 and capable of independent removal. The plate p^2 is here shown as attached by a screw q' to a flange r', formed on the bed or guide y.

s' represents a hardened-steel shear-blade attached to the inner end of the former d and having its cutting-edge formed as a re-entrant angle, the faces of which are flush with the faces that compose the acting portion of the former. The blade s' is attached by a screw l' to the former, as shown in Figs. 3 and 5, the former having a socket or recess formed in its rear end to receive the blade s'. The blade s' is arranged to be in close contact with the plate p^2 and fixed blade p', so that in descending it will co-operate with said fixed blade in severing the projected portion of the strip r. It will be seen that the angular form of the reciprocating blade s' enables it to commence cutting the strip r at the edges of the latter, the cutting action progressing inwardly from the edges toward the center, while the severed portion is at the same time being bent by the combined action of the blade s' and former d into its angular form, so that the piece which is to form the stay is not severed from the main strip until it is bent to such an extent that it will drop to place on the box-body s without liability to being misplaced in passing from the cutters to said box-body. If the reciprocating blade s' were straight, the strip r would be severed more quickly and while in a flat condition, so that it would be liable to be
377 displaced in falling from the cutters to the box-body on the mandrel. The strip r is gummed on its under side before being rolled upon the spool w, the gum coating being in a dry condition.

To moisten the gum coating and thereby adapt the stay to adhere to the box-body, I provide a water-tank w', which is supported by the frame of the machine between the spool w and the mandrel e, and is provided with a roll w', which is partially submerged in the water, and is arranged so that its upper portion is in contact with the gummed under surface of the strip r. Said roll moistens the gum coating so that the stay, severed from the strip as above described and pressed by the former on the box-body, will adhere to the latter.

Power may be applied to the driving-shaft c in any suitable way. I prefer to employ a driving-pulley x', which is loose upon the shaft, and is provided with suitable automatic mechanism whereby it may be connected with the shaft to rotate the latter by the depression of a treadle or otherwise and automatically disconnected therefrom at the end of each complete rotation, the arrangement being preferably such that the shaft c will stop when the cross-head and former are raised high enough to bring the cutter s' above the strip-guiding slot, but not to its highest point. The box-body is then placed on the mandrel while the former is at rest and the machine is then started, the plunger completing its upward movement, then

descending to cut off and apply the stay, and then rising and stopping as before.

The object of stopping the former before it reaches the end of its upward movement is to give time for the feeding of the stay-strip after the box is placed on the mandrel, the partial upward movement of the former before its descent giving the desired time. Suitable automatic mechanism for producing this result is shown in letters patent of the United States granted to me July 4, 1882, for friction movement, and numbered 260,394.

To prevent the shaft *c* from rotating loosely or by its own momentum, I provide a friction-brake *y'*, which is arranged to bear against the under side of the shaft, and is pressed upwardly thereagainst by a spring *z'*, as shown in Fig. 3.

It will be seen that the strip-feeding devices are arranged to move the stay-strip lengthwise of the mandrel, and that the strip-severing blades are arranged crosswise of or substantially at right angles with the mandrel. As a result of this arrangement, the stay-strip can be adjusted to the height of the box by varying the length of the feed movement, no variation in the width of the strip being required.

Another advantage of the angular cutter *s'* is that by commencing to cut the strip at its edges, instead of cutting entirely across the strip at once, the cutter holds the strip while the feed-dog is being retracted, and therefore aids the dog *m'* in preventing backward movement of the strip.

I claim—

1. In a box-staying machine, the combination, with an angular mandrel formed to support a box-body, of a reciprocating cross-head and a former having a lower re-entrant-angled acting face and adjustably fixed to said cross-head at opposite points, whereby the former is enabled to be adjusted to the differences of position of the corner of a box caused by differences of thickness of the sides forming said corner, substantially as set forth.

2. In a box-staying machine, the combination, with an angular mandrel formed to support the box-body, of a reciprocating cross-head, a former having a re-entrant-angled acting face and slots in its upper horizontal portion, and the screws passed through said slots and secured to said cross-head, substantially as set forth.

3. In a box-staying machine, the combination, with an angular mandrel, of a reciprocating cross-head, a former secured thereto having a lower re-entrant-angled acting face, a re-entrant-angled shear-blade affixed to said former, and the straight fixed shear-blade having a strip-guiding slot, substantially as set forth, whereby a strip is gradually cut from its outer edges, as stated.

4. In a box-staying machine, the combination, with an angular mandrel, of a former, a shear-blade secured thereto, said former and shear-blade having lower re-entrant-angled acting faces, the table or guide *y*, having a straight fixed shear-blade secured thereto, an upper plate p^2, said plate and blade forming the walls of a strip-guiding slot, and the dog *m'*, secured to said plate and designed to hold the strip during the rearward movement of the feeding device,

said shear-blades also serving to hold such strip, substantially as set forth.

5. In a box-staying machine, the combination of a supporting-frame having the seat or support *g*, the mandrel having a shank bearing on said seat, the clamp *h*, having an upper portion surrounding the said mandrel-shank, its lower portion being screw-threaded and the nut screwed thereon and bearing against the under side of said seat or support, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of March, A. D. 1890.

JAMES A. HORTON.

Witnesses:
C. F. BROWN.
A. D. HARRISON.

16561

The Bag. Hobbs v. Beach } p. 380

C. E. SAWYER.

Label and Tag Machine.

No. 166,940. Patented Aug. 24, 1875.

Fig. 2.

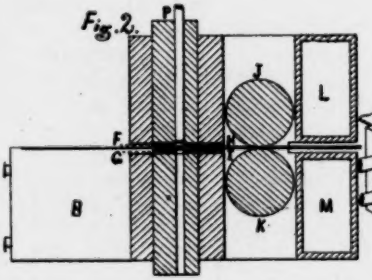
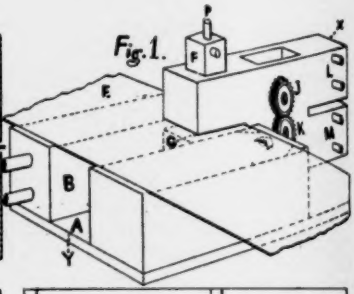
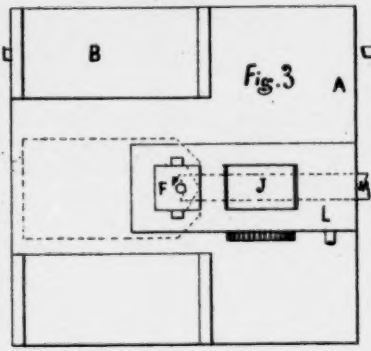


Fig. 1.





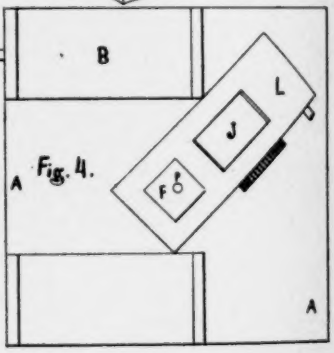
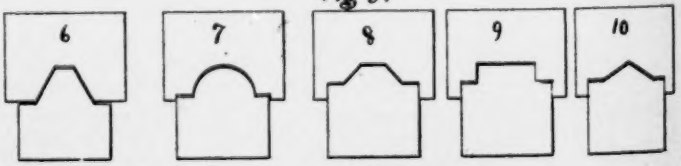


Fig 5.



WITNESSES.

Albion A. Adams.

Samuel A. McCready

INVENTOR.

Charles E. Sawyer

Per Sylvenus Walker Atty

381 UNITED STATES PATENT OFFICE.

CHARLES E. SAWYER, of Boston, Massachusetts.

Improvement in Label and Tag Machines.

Specification forming part of Letters Patent No. 166,940, dated August 24, 1875; application filed February 10, 1874.

To all whom it may concern:

Be it known that I, Charles E. Sawyer, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in label and tag machines, of which the following is a specification:

My invention relates to that class of machines for making paper tags, wherein an additional piece or patch is gummed or cemented to each side of the tag, in order to strengthen the eye of the same.

The objects of my invention are to increase the working capacity of such machines, and to greatly reduce the cost of such tags, and further strengthen the eyes of the same, and use patches of such form as can be cut without any waste of material, and cemented to the tag at such point as to make available the entire strength of the patch, against tearing out the eye of the tag, and, further, to employ heat to soften the gum or cement, especially when shellac is used to adhere the strengthening-patch to the tag or label; and it consists in providing steam-boxes, arranged in such manner as to heat the gum-strips, partially softening the gum upon the same, but not sufficiently to cause them to stick or adhere together, and then complete such softening by heating the tag or label stock itself, so as to cause the two to unite firmly and quickly when brought together by pressure, preventing thereby the tendency of the patch to swell and warp, as is the case when the gum is reduced by alcohol or moisture sufficiently to adhere. My invention further consists in the form of the dies or cutters for cutting off from a continuous strip of strengthening material patches contiguous to each other without any waste of material intervening; and, further, in feeding the gum-strips diagonally to the tag or label, or the strip or stock from which they are to be cut, when using a square patch, set on diagonally with the tag, and the eye cut through the same.

When the tags or labels are designed to be used without exposure to moisture, I employ sponges to moisten the gum used for sticking the patches on or around the eye of the same. These may be used with or without the steam heating-boxes. Being supplied with moisture, they soften the gum upon the patch-strip, when gums or glue are used that can be dissolved in water.

(Here follows diagram marked p. 380.)

Figure 1 is a perspective view of my invention as arranged for feeding the gum-strips at a right angle with the tag. Fig. 2 is a vertical central section through Fig. 1, as shown by dotted lines *x y*. Fig. 3 is a top plan view, showing the tag and gum strips in dotted lines. Fig. 4 is a similar view, with the feed-rolls set diagonally, so as to apply square patches. Fig. 5 shows forms of dies or cutters, 6, 7, 8, 9, and 10.

A is the frame of the machine, on the top of which is placed a steam-box, B, having inlet-pipe C and outlet-pipe D. Suitable mechanism is provided to feed along the tag or label stock E. It, passing over the steam-box B, is heated as required. When it reaches the cutters or dies F and G its motion ceases, and the patch-stock or gum-strips H and I are fed between the upper and lower cutters or dies F G. By means of the feed-rolls J and K the cutters or dies F G are brought toward each other, each cutting a patch from the gum-strips H and I which have passed in contact with the heating-boxes L M. Such patches are, while hot, pressed against each side of tag-strip or stock E near its edge, which, being hot, melts the gum, and it adheres under pressure instantly. Then the eye-punch P passes down through the tag or label stock and forms a small round hole. When the whole moves along the width of another tag a corner cutter comes down and cuts a triangular piece from the edge of the tag-strip, when a knife or shears severs the same from the strip, thus forming a tag. Suitable mechanism, well known, is employed to give the proper intermittent motions to the several parts, being driven by hand or other power.

Fig. 5 shows several forms of dies or cutters which will cut the patches from the gum-strip, contiguous to each other, without waste of the material. These patches are designed to partially surround the eye of the tag, as shown; but if it is desirable to have the eye cut through the center of the patch, the cutters are adjusted diagonally to the tag-stock, as shown in figure. This will admit of a square patch being cut from the strip, as in the former method, and cemented to the tag or label diagonally, being stronger of the same size than if attached parallel with the sides of the tag.

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Having thus described my invention, what I claim is—

1. The combination of the heating-box B with the cutters or dies F and G, or their equivalents, constructed substantially in the manner described, as and for the purposes set forth.

2. The combination of heating-boxes L and M, with feed-rolls J K and dies F G, or equivalents, constructed substantially in the manner described, as and for the purposes set forth.

3. The combination of the heating-box B with the feed-rolls J and K, dies F and G, heating-boxes L and M, constructed to operate substantially in the manner described, as and for the purposes set forth.

CHARLES E. SAWYER.

Witnesses:
SYLVENUS WALKER.
WM. A. CLOUTMAN.

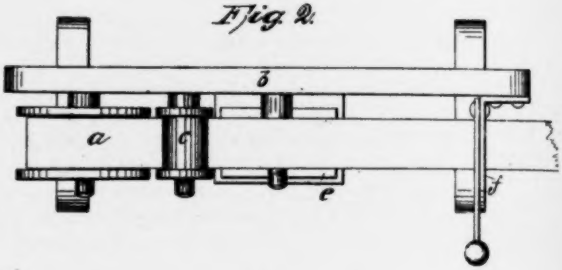
16563

W. ORR, Jr. & G. F. WRIGHT.

RIBBON HOLDER FOR BOX COVERINGS.

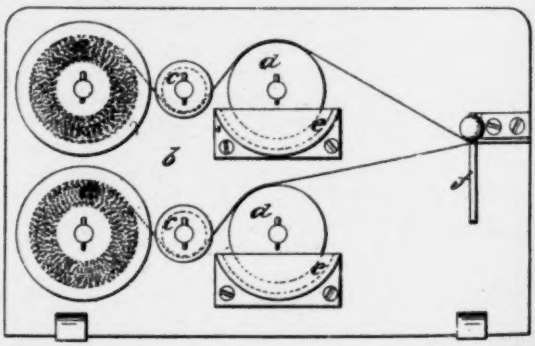
No. 58,466. **Patented Oct. 2, 1866**

Fig. 2.



No. 139. Models, p. 384. Rules

Fig. 1.



Witnesses:
Samuel A. Duncan
K. K. Wales

Inventors.
William Orr Jr
George F. Wright

385 UNITED STATES PATENT OFFICE.

WILLIAM ORR, JR., and GEORGE F. WRIGHT, of Clinton, Massachusetts.

Apparatus for Holding Paper Ribbon.

Specification forming part of Letters Patent No. 58466, dated October 2, 1866.

To all whom it may concern :

Be it known that we, Wm. Orr, Jr., and George F. Wright, of Clinton, county of Worcester, State of Massachusetts, have invented a new and improved method of preparing paper for covering paper boxes; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

In describing the nature of our invention, its value and importance will be better understood by a brief description of the present mode of preparing paper for covering boxes. At present all the fancy papers and others used for this purpose can be obtained in the market only in sheets and reams, and box-makers cut them in pieces of a suitable width and length to wrap around a box, which process, with the strictest economy, is always attended with a large per cent. of waste; hence to avoid such waste, and for other valuable considerations, we make covering-papers or paper ribbon of suitable widths and of indefinite lengths to suit customers, which, for convenience, we wind upon spools or blocks like rolls of ribbon, or in rolls like tape, rendering it merchantable and convenient for box-makers, as will appear when reference is had to the drawings accompanying this specification.

The convenience and economy of using such rolls of considerable length we have endeavored to make manifest by the stand with guide-rolls, paste-rolls, and shears, which can be used in connection with a machine for covering boxes, or separately with great advantage.

(Here follows diagram marked p. 384.)

Figure 1 represents a front elevation of a stand upon which the rolls of paper ribbon and guide-rolls, paste-rolls, and shears are placed. Fig. 2 represents a top view of stand and rolls.

The rolls of paper ribbon are represented by the letters *a a* upon the stand *b*, the end of the paper ribbon being drawn under the guide-rolls *c c* and over the paste-rolls *d d*, causing said paste-rolls to revolve in the paste box or trough *e e*, through the paste contained in them, lays it upon the surface of the paper, which is drawn through the open shears *f*, and wound upon a box and cut off by the attendant of a suitable length to cover one box.

What we claim as our invention, and wish to secure by letters patent, is—

The use of the shears *f*, or any device which will sever paper, in connection with the paper ribbon *a* and paste-rolls *d* above mentioned, as and for the purpose specified and shown.

WILLIAM ORR, JR.
GEORGE F. WRIGHT.

Witnesses:

C. F. W. PARKHURST.
H. H. WATERS.

16565

(No Model.)

G. MUNRO.

BOX MACHINE.

No. 244,919. Patented July 26, 1881.

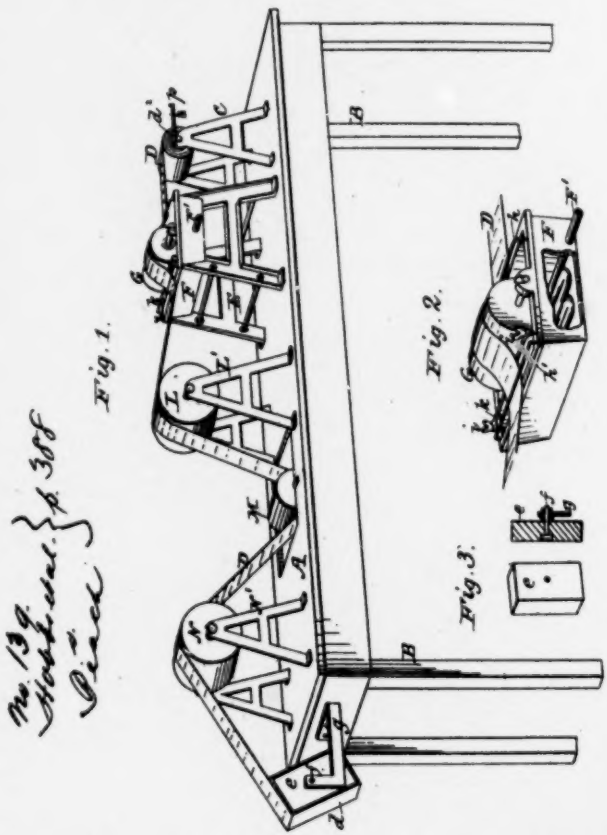


Fig. 1.

Fig. 2.

Fig. 3.

No. 13 G. Hobbs Mar. Co. Patent 388

Witnesses.
W. H. Ellarson
W. E. Brown

Inventor
Gordon Munro,
by E. E. Masson
atty

389

UNITED STATES PATENT OFFICE.

GORDON MONRO, of Troy, New York.

Box-machine.

Specification forming part of Letters Patent No. 244,919, dated July 26, 1881. Application filed May 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, GORDON MONRO, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented certain new and useful improvements in machines for covering boxes, of which the following is a specification.

My invention relates to improvements in machines for covering pasteboard boxes with paper, in which the paper is taken from a roll or coil and passed over a roller resting in a past-box and over or under other rollers to a box resting upon a form adapted to revolve; and the objects of my improvements are to produce an inexpensive machine in which the amount of paste received on the paper can be regulated, the paste or glue retained in a warm or hot state, and the delivery of the paper from the coil is adjustably accomplished. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

(Here follows diagram marked p. 388.)

Figure 1 represents a perspective view of the entire machine. Fig. 2 represents a perspective view of the paste-box on an enlarged scale, and partly broken on the side to show the interior; and Fig. 3 represents, in perspective and section, one of the box-formers used with the machine.

In said drawings, A represents the top of a table, and B the legs thereof. Upon said table is mounted, at one end, on a light frame, C, a roll of paper, D, of suitable width to cover a box, *d*, mounted at the opposite end of the table upon a block or former, *e*, nearly fitting its interior. Through the center of this block *e* passes a bolt, *f*, upon which it can freely revolve, the bolt projecting from the side of a bracket, *g*, secured to the end of the table.

Adjoining the frame carrying the roll of paper is placed upon the table A a frame, E, supporting at a suitable height the paste-box F, the latter containing the paste-roller G, adapted to revolve with the lower portion of its periphery dipping into the paste or glue contained in the box F. Within this box is placed a flat coil or pipe, F′, through which hot water or steam can be made to circulate to keep the contents of the box at a suitable temperature to prevent the paste getting into lumps if paste is used, or to keep the glue in a fluid state if glue is used. Upon the edges of the paste-box F are secured two transverse rods, *h* and *h′*, to retain the strip of paper in contact with a large surface of the paste-roll as said strip passes

under said rods and over the roll. To regulate the amount of paste or glue adhering to the paper and remove any excess thereof, there is placed across the path of its pasted surface a scraper, *k*, having each end supported by thumb-nuts *i*, having their screw-tapped lower end secured to the edge of the paste-box, so that by elevating the scraper it will come more forcibly against the paper, remove a portion of the paste, and return it to the mass under it. From the paste-box the strip of paper is conducted over a roller, L, then under a roller, M, set in an opening in the top of the table, or on a level lower than the roller M, and again over a roller, N, set on a frame, N′, higher than the roller M, to the box *d*, where it is laid smoothly thereon by the operator with one hand, while with the other hand he revolves the box and block upon which it is mounted against the tension exerted by the friction-strap or adjustable weighted lever *p* resting upon the journals d^2 of the paper-roll.

By bending the strip of paper D first in one direction over the roll L, and then in the opposite direction under the roller M, and again over the roller N, the damp paper becomes "tempered," and can be laid very smoothly upon the box under construction. And by keeping the paste heated it will become partly "set" upon that side of the paper to which it is applied and will not affect the face of the paper, and the straw-board of the box will absorb the moisture.

Strips of cloth can be used with this machine as well as strips of paper, and be secured on the boxes with starch, paste, or glue, as may be desired.

Having now fully described my invention, I claim—

1. The combination of the table-top A, paper-roll-supporting frame, paste-box F, and heating-pipe F′ with guide-rolls L M N and block *e*, adapted to revolve, substantially as and for the purpose described.

2. The combination of the table-top A, paper-roll-supporting frame, paste-box F, and adjustable scraper *k* with guide-rolls and block *e*, adapted to revolve, substantially as and for the purpose described.

GORDON MUNRO.

Witnesses:
E. SMITH STRAIT.
ROBERT E. ATWELL.

(Model.) 2 Sheets—Sheet 1.

H. INMAN.

PAPER BOX COVERING AND TRIMMING MACHINE.

No. 253,711. Patented Feb. 14, 1882.

Fig. 1.

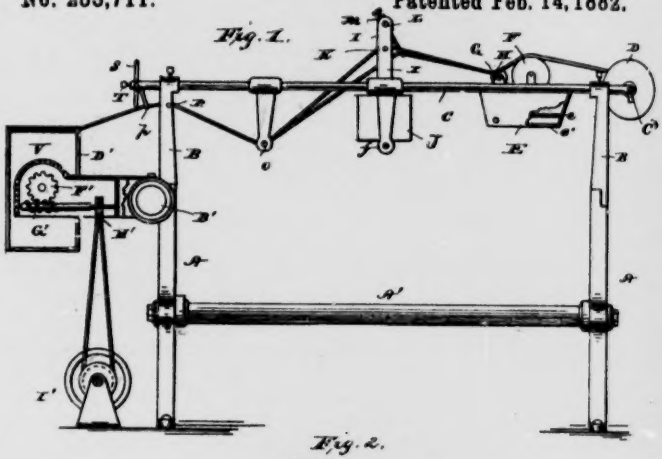
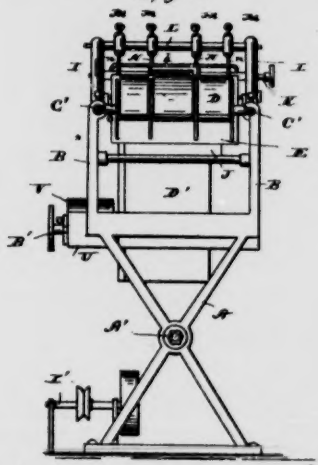


Fig. 2.



No. 139. Hobbs' Mar. 5, 1872. Block.

Witnesses,
Edwin L. Jewell,
J. J. McCarthy.

Inventor,
Horace Inman.
by C. M. Alexander,
his Attorney.

(Model.) 2 Sheets—Sheet 2.

H. INMAN.

PAPER BOX COVERING AND TRIMMING MACHINE.

No. 253,711. Patented Feb. 14, 1882.

Fig. 3.

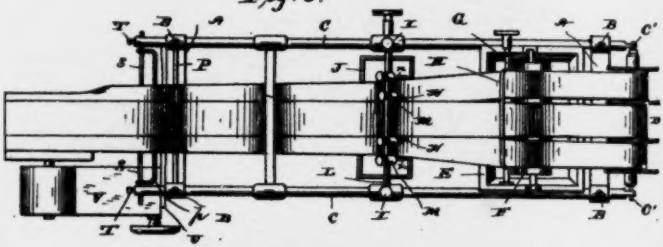


Fig. 4.

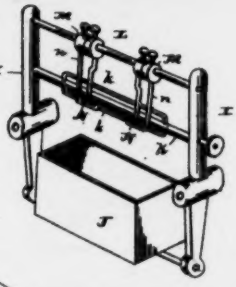


Fig. 5.

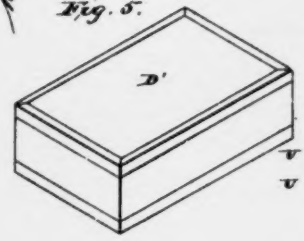
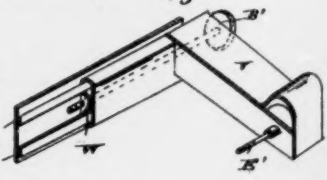


Fig. 6.



Witnesses.
Edwin L. Yemee
J. J. McCarthy

Inventor.
Horace Inman.
by C. M. Aldrich & Co.
his Attorney.

395 UNITED STATES PATENT OFFICE.

HORACE INMAN, of Amsterdam, New York.

Paper-box Covering and Trimming Machine.

Specification forming part of Letters Patent No. 253,711, dated February 14, 1892. Application filed November 29, 1881. (Model.)

To all whom it may concern:

Be it known that I, Horace Inman, of Amsterdam, in the county of Montgomery, and in the State of New York, have invented certain new and useful improvements in paper-box covering and trimming machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to that class of machines employed for automatically covering boxes with an outer coating or surface of paper, cloth, &c.; and it has for its object, first, to provide mechanical means for supporting, pasting, and conducting the material used for covering to the boxes, and, secondly, in providing means for sustaining and revolving the boxes while undergoing the process of covering. These objects I attain by the mechanism illustrated in the accompanying drawings, in which—

(Here follow diagrams marked pp. 392 & 394.)

Figure 1 is a side elevation of my apparatus; Fig. 2, an end elevation, looking toward the end of the machine carrying the reel on which the paper, cloth, or other covering material is wound. Fig. 3 is a plan or top view of the machine. Fig. 4 is a detail perspective view of the standards which sustain a paste or glue drip pan or tank, the transverse bar for supporting the paper, and the guiding points or fingers. Fig. 5 is a perspective view of a box, showing the covering and trimming applied thereto; and Fig. 6, a detail perspective view of the carriage to which the form is secured and the track on which said carriage travels.

The letter A indicates a pair of legs or standards, which are made in any convenient or desirable form, and of any material found most suitable for the purpose, preferably of cast-iron, and which are connected or otherwise braced together about midway their height by a rod or bar, A′, their lower ends being firmly secured to the floor. The upper extremities of these legs or standards are bifurcated or divided respectively into two vertical extensions, B. These extensions are provided with suitable apertures and set-screws for the reception and retention of the bars or ways C, one end of each of the latter being also bored out, as indicated at C′, for the purpose of receiving the journals of a reel, D. This reel is constructed of a series

of disks strung on a shaft a short distance apart, forming deep grooves or passes, in which the several strips of covering material or paper are wound.

The letter E indicates a paste tank or vessel having a double bottom, for a purpose hereinafter named, made of any suitable material, resting at each of its sides on the said bars C. Immediately above said tank is journaled a paste-delivering roller, F, adapted to come down a short distance within the said tank and engage the glue or paste therein, for a purpose hereinafter more fully set forth. At one end, on the upper side of this tank E, is suitably journaled a cross shaft, G, which is provided with a link, H, between which and the said bar the paper is adapted to travel, the object of which is to remove from the paper all surplus glue or paste, at the same time spreading and leaving a sufficient quantity for the purpose intended. About midway the said bars C, and fitting smoothly thereon, is a pair of standards, I I, connected at their lower extremity by a cross-rod, which serves to support a tank or pan, J, which catches any paste that may be removed or scraped from the paper during its passage between said standards. At a point above the bars C C another cross-shaft, K, is journaled to these standards, having a link, *k*, projecting from each side thereof, between the lower of which links and the shaft K the two outer strips of paper (or those known as "trimmings") are adapted to pass, while between this shaft and the upper link the covering proper travels. Near the top of these standards I I is a further cross shaft, L, having strung thereon a series of heads or blocks, M M, the two inner of which carry depending fingers or guides N N, which embrace the edges of the covering material, and serve to guide the same over the said cross-shaft K, the latter being intended to separate the covering material from the side strips or trimming. The two outer heads or blocks are also provided with depending fingers or guides *n n*, having horizontal extensions which fit under the outer strips or trimming, for the purpose of guiding said strips in their proper course, and also for bringing them nearer together, in order to effect a lap between them and the covering. Each of these heads
396 or blocks is provided with a set-screw for firmly holding them in place. Along the bars C C is a further pair of standards, which are suitably bored to fit the bars, and which depend downwardly a short distance, supporting a rod, O, under which the covering and trimming pass, and at which point they are made to bear firmly against one another, thus serving to unite them together by means of the paste or glue with which the lower side of the covering is coated.

The letter P indicates another supporting bar or rod, located between upper extensions of one of the legs, which, in connection with the rod *p*, supports the covering and trimming, which have now become united, as they pass between the guides S S, adjustably journaled to the bars C C, the latter having set-screws T T for retaining the guides in proper place.

The outside of the legs is provided with a track or way, U U, upon which is adapted to reciprocate a carriage, V. The letter W

indicates a screw-threaded lug, and the letter B′ a thumb-bolt, the latter being suitably swiveled or journaled to the carriage V, and adapted to engage the said lug, by which the said carriage is given a positive transverse motion and brought in such position as to bring the form D′ in line with the course of the covering. This form is secured to a transverse shaft, E′, journaled in the carriage before mentioned, and is rotated by means of a spur-wheel, F′, mounted on said shaft and meshing with a worm G′, which also has its bearings in the said carriage. The letter H′ indicates a grooved wheel mounted rigidly on the shaft of this worm, which receives a rotary motion by means of belt passing over the same and connecting with a suitable driving mechanism, I′, located in close proximity to the machine, and provided with such auxiliary appliances as to render it completely under the control of the operator, permitting him to start and stop the said form at will.

The operation of my machine may be readily understood by the following description in connection with the foregoing: The reel D being supplied with the covering and trimming material, (usually paper,) the free ends thereof are passed over the paste-roller F, and through the space between the shaft G and the link H, by which shaft and link the paste is properly spread. The covering is then passed between the shaft K and link *k*, and the trimming below said shaft, and over the lower link, *k*, after which they unite at the cross-bar O, having been caused to lap each other by means of the fingers *n n* pressing against the outer edges of the said strips of trimming, and thus continue on and over the supports P and *p* and between the final guides S S until the free end is attached or stuck to the box to be covered. The operator then rotates the form D′, thus revolving the box and permitting of a continuous wind of the covering around the box, that part known as the "trimming" being pressed down over the edges of the said box.

It will be noticed that during the passage of the covering through the machine any surplus paste which may happen to adhere thereto, after having been applied by the paste-roller F, will be removed by the shaft K and links *k*, and caught by pan J.

The paste-tank is provided with a double bottom, *e e′*, the space between which is charged with steam or other heating agent to prevent congealing of the paste.

The tension of the covering material and trimming is regulated by changing the relative position of the paste-roller F, standards I I, and rod O, each of which is adapted to slide independently of the other on the bars C C, their weight being such as to retain them in any fixed position without the aid of any further fastening. The covering and trimming may be of the same or different colors.

Having thus fully described my invention, what I claim as new, and desire to secure by letters patent is—

1. In a machine for covering boxes, the combination, with the bifurcated legs and the supporting-bars, of a feeding-reel bearing covering and trimming strips, the paste-tank and paste-roller, the standards with their guiding and supporting devices, and the cross-bar

and guides for uniting, supporting, and guiding the covering and trimming strips, substantially as set forth.

2. In a machine for covering boxes, the supporting-frame, in combination with the paste-tank carrying a paste-roller, the standards with their guiding and supporting devices, and the cross-bar for uniting the covering and trimming, the said tank, standards, and uniting cross-bar being adapted to slide on the supporting-bars, whereby their relative distance is changed and a proper tension of the covering material maintained, substantially as shown and described.

3. In a machine for covering boxes the combination, with the devices substantially as described, for feeding, pasting, guiding, supporting, and uniting the covering material, of a lateral adjustable carriage, carrying a revolving form, and provided with mechanism for automatically rotating the same, substantially as shown and described.

4. In a machine for covering boxes of the character herein described, adapted to manipulate a plurality of covering and trimming strips of paper, &c., the combination of the standards I I, shaft K, having link *k*, and shaft L, with heads M M and fingers or guides N *n* for guiding and lapping the strips, as shown and described.

In testimony whereof I affix my signature, in presence of two witnesses, this 17th day of November, 1881.

HORACE INMAN.

Witnesses:
H. AUBREY TOULMIN.
HARRY INMAN.

16571

(No Model.) 2 Sheets—Sheet 1.

G. MUNRO.

BOX COVERING AND TRIMMING MACHINE.

No. 298,879. Patented May 20, 1884.

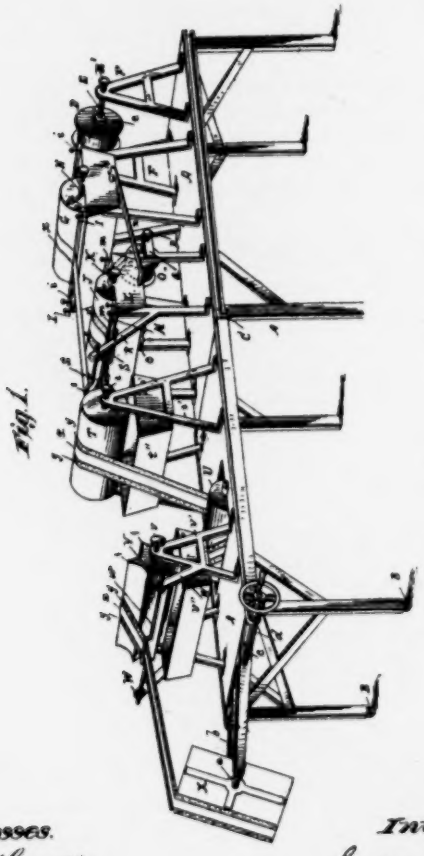


Fig. 1.

Witnesses.
Robert Everett.
J. Walter Blandford

Inventor.
Gordon Munro
By Marcellus Darby
his atty.

16572

(No Model.) 2 Sheets—Sheet 2

G. MUNRO.

BOX COVERING AND TRIMMING MACHINE.

No. 298,879. Patented May 20, 1884.

Fig. 2.

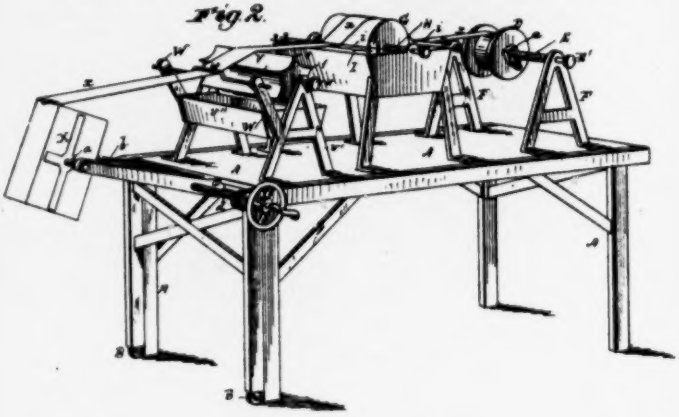


Fig. 3.

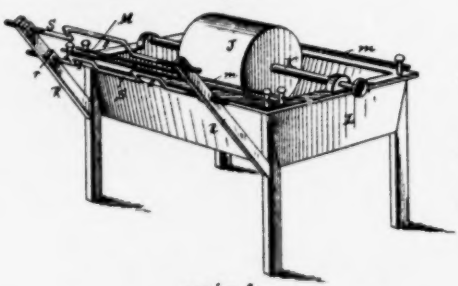


Fig. 4.

Witnesses.
Robt Ewalt
J. Walter Blandford

Inventor.
Gordon Munro
By McAuliffe Darby
his Atty

401 UNITED STATES PATENT OFFICE.

GORDON MUNRO, of Troy, New York, assignor, by mesne assignments, to the American Box Machine Company, of New York.

Box Covering and Trimming Machine.

Specification forming part of Letters Patent No. 298,879, dated May 20, 1884; application filed March 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, Gordon Munro, a citizen of the United States, and a resident of the city of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful improvements in box covering and trimming machines, of which the following is a specification.

This invention relates to the class of machines employed for applying an external covering or surface, of paper, cloth, or other such material, to boxes and box-covers which have been already entirely or partially formed; and it embodies improvements upon the invention patented by me in United States letters patent dated July 26, 1881, and numbered 244,919, and by its use a plurality of strips or pieces of covering material, and covering and trimming material combined, which may differ in color, width, and fabric, may be simultaneously applied to the box or cover.

(Here follow diagrams marked pp. 398 & 400.)

Figure 1 illustrates the complete apparatus in perspective. Fig. 2 illustrates the table as it appears when not extended. Fig. 3 illustrates one of the paste-boxes with the guides attached thereto. Fig. 4 illustrates the guides, showing their capacity for adjustment.

Like letters indicate like parts in all the figures.

A is the frame of a table or bench, made of any suitable material. It may be braced, strengthened, and ornamented as desired. I prefer to make this table or bench in sections, so that it shall be capable of longitudinal extension, if desired, the legs of the movable part being, preferably, provided with casters B, to facilitate such extension, and the two parts may be steadied and held in engagement with each other in any desired manner. For this purpose I have illustrated in the drawings an ordinary tongue-and-groove sliding joint, as at C. This feature is at times desirable for the purpose of shortening it when but few tempering-rollers are required, or when a material not requiring tempering is used, or when the trimming-strip attachment is not desired, and thus save factory space.

In Fig. 2 the top of the extension part, together with parts carried by it, has been removed, leaving only side rails and the front cross-rail and box-support carried thereby, the said part has been closed up on the other, the rolls J T and their appurtenances have been removed, and in their place has been substituted the final temper-

ing-roller V and its appurtenances, formerly on the extension part. The machine thus contracted can be used for applying a covering-strip.

D represents a reel containing a roll of covering-paper or other material, or it may be a roll of such material not upon a reel, if desired. It is supported upon a shaft, E, which shaft rotates on pivot-screws E′ in suitable frames or other supports, F, and is preferably provided with a friction attachment; and G is a roller for applying any desired adhesive substance to the material. I will designate the rollers for applying the adhesive substance "paste-rollers;" but paste, glue, or any other suitable adhesive substance, hot or cold, may be used. The roller G revolves on a shaft, H, within a double-bottomed paste-tank provided with heating appliances *h*, and with an adjustable paste-scraper, I, which is not so sharp as to cut the material, and with the bars *i i* to hold the strip to the roller, all as set forth in my said former patent, and which do not require further explanation here, save only to state that I make the reel, or the roll of material, adjustable laterally in either direction on its shaft E by clamping it between two disks or washers, *e*, which are threaded on the inside, and through which the shaft E passes, which is also threaded its entire length. By this means I am enabled not only to determine the starting-point of the covering material, but I am enabled to put any number of reels or rolls containing the same material or differing materials and of different colors on this shaft, and confine them in their proper place by clamping-disks furnished for each reel or roll, whereby the material will be properly fed to the paste-roller, and be kept in right lines with the guides and the trimming material, as hereinafter described, whereby not only is the work more accurately done, but the strain or pull on the material is kept in a straight line, and not on one edge more than the other. This reduces the liability of breaking the strip.

J is another paste-roller, supported on its shaft K, and re-
402 volving in its paste or glue tank L, which is preferably provided with a double bottom for heating the paste or glue, and is also furnished with the scraper M, and strip-confining bars *m*, all substantially the same as the paste or glue roll G.

O is a second reel, upon which is wound the trimming material, or it may be a roll of such material not on a reel. This is supported on a shaft, P, which is supported by and rotates in the brackets Q, which extend rearwardly from the supporting-frame of tank L. This reel or roll may be supported on a frame entirely separate and independent of the tank L, if desired, and its shaft is furnished with the friction appliance, screw-threads, and reel-locating disks, the same as the reel D, and for the same purposes. In the particular arrangement shown in the drawings the covering-strip is bounded on each edge by a trimming-strip, and there are, as shown, two reels O on shaft P, one for each trimming-strip. Of course, if but one trimming-strip is used, only one reel or roll O will be required.

At the front side of the tank L, I provide two upwardly-extending rigid arms, R R. (Best seen in Figs. 3 and 4.) They are there

shown as attached to the frame of the tank L. They may, however, be entirely separate and independent from the tank, deriving support from the table or any other suitable part of the apparatus. A continuous slot or suitable holes are made in the upper part of these arms to receive and support the guides S. These guides are metallic rods in which are formed bends or recesses *s*, which are made of such size as will conform, respectively, to the width of the covering and the trimming material being used; and these guides should have as many such recesses as there are separate strips of the covering or the trimming material, and the bends are located on the rods, and the rods are adjusted laterally in relation to each other, so that the desired relation of the trimming and the covering strips will be secured. The guide-rods are somewhat longer than the distance between the arms R R, and the ends, or one of them at least, are threaded, and are provided with threaded nuts *r r*, whereby the guides may be laterally adjusted across the machine by running the nuts both to the left or both to the right until they impinge against the arms R R, one or both, as the case may be. The paste, glue, or other adhesive substance in these tanks may be kept warm and fluid by means of a lamp placed under them, water being placed in the jacket; or, as shown in the drawings, they may be heated by steam, and the exhaust from one may pass into the other by means of the pipe *u*, and any suitable escape for the condensed steam and for the purposes of circulation provided from the second tank. I do not limit myself, however, to these double bottomed or jacketed tanks, for a single-bottomed pan-like receptacle will operate quite well, especially if paste or any suitably prepared adhesive substance be used.

T is a roller turning on a shaft or points, *t*, which is supported on a frame, *t'*. It is preferably placed immediately in front of the guides. Upon this roller the covering and the trimming-strips are brought in contact with each other and united, and beneath it I place a pan, *t''*, to catch any surplus glue or paste which may be squeezed out from between the strips and the roller.

U is another roller, located below the roller T and in front of it. It is supported on a properly-sustained shaft; and V is another roller, placed above the roller U, and in like manner supported on a shaft or points, *v*, and frame *v'*, and, if desired, provided with a drip-pan, *v''*, the same as the roller T. The rollers U and V are "tempering rollers," the function of which is to increase or decrease the time required for a given point on the material to travel from the paste-tanks to the box or cover, thus giving the paste or glue an opportunity to more or less penetrate the material, as required. At the front side of the roller V, I provide two upwardly-projecting rigid arms, W W, substantially the same as the arms R R, which support a guide, *w*. This guide may be made adjustable laterally across the machine, as the other guides are; but this will not usually be necessary, because the lateral adjustment of the box or cover support X, hereinafter to be explained, affords adjustment at this point. The bend or recess in the guide *w* should be of such width as to conform to and guide the combined covering and trimming

strips, and the guide *w* should be placed as near as practicable to the box and cover supporter X, the better to apply the combined strips to the box or cover. As stated, X is a support or form upon which the box or cover is placed. This support may be of any shape to conform to that of the box or cover. It is fastened upon a short shaft or arm, *a*, which projects, preferably at right angles, from the forked carrier-arm *b*. This arm *b* is rigidly attached to a carrier-block, *c*, which moves in any suitable ways fastened on or made in the end of the table, and is moved back and forth by the threaded shaft *d*, which engages with screw-threads in the carrier-arm *b*, or the block *c*, as desired.

The operation is as follows: The covering-strip *x* starts from the reel or roll D; thence it passes over the paste-roller G, where it receives the paste or glue, the surplus being removed by the scraper I; thence it passes to the upper guide, S, and through the bend or recess in it, which is adapted to fit and guide it. This guide is adjusted between the arms R R, to correspond to the adjustment of the reel or roll D. The trimming-strips *y* (there being two shown in the drawings) start from the reels or rolls O, receive glue or paste from the paste-roller J, the surplus being removed by the scraper M, and thence pass to the lower guide, S, each of the bends of which
403 receives one of the strips. This guide is so adjusted relatively to the other one that it will apply the trimming-strips to the covering-strip, as may be desired. After passing through the guides the strips all pass over the roller T, where they are brought in contact with each other and adhere together, and any excess of paste or glue which is squeezed out between the roller T and the strips is caught in the drip-pan *t''*. Thence the strips, now united, pass downward around the roller U, and thence up over the roller V and through the guide *w*, and are applied to the box or cover by the operator, who turns it with his hand. The box or cover is properly located laterally by laterally adjusting the box support or form X. It will thus be seen that the reels or rolls being laterally adjustable on their shafts, (each shaft having one or more such reels or rolls, as desired,) and the guides also being laterally adjustable in the arms R R, and provided with one or more bends to receive and guide one or more trimming or covering strips, a great variety of combinations of covering and trimming strips can be made, either for ornamentation or economy.

For the purpose of properly "tempering" the strips there may be additional rollers placed between the second paste-tank and the guides adjacent thereto. This may be necessary sometimes, because the strip or strips coming from the shaft E will have received the paste or glue before the strip or strips coming from the shaft P receive it, and thus the "temper" of the two strips be different, which may occasion wrinkles or imperfect adhesion; also, any desired number of rollers and any desired space may be interposed between the uniting-roller T and the last roller, V, to give the desired temper to the united strips before they are applied to the box or cover.

I prefer to form upon the surface of the rollers which are located between the box-supporting form X and the roller T, and against

which the glued or pasted side of the material presses, longitudinal ridges, as shown at 1, the outer edges of which are of small area, and I put them sufficiently close together, so that the material will span from one ridge to the other, not coming in contact with the surface of the roller, because the glue or paste has become partially set and is very adhesive by the time it reaches these rollers, and is apt to stick to the rollers to such a degree that the pull might break the material. The rollers other than the paste-rollers and the uniting-roller, which should preferably be truly cylindrical and have smooth surfaces, may be made in any desired manner—for example, as reels are made, being composed of a number of bars set in heads at each end; and in order that the covering and trimming material may have at all times the same degree of tension on the machine, and may not slacken up when cut off, consequent on the completion of a box, I apply slight friction to the shaft of the last roller—*i. e.*, the one adjacent to the box-form—or in any other suitable manner prevent this roller from turning backward when the material is cut off. This friction may be applied to any other of the rollers in front of the uniting-roller, or to the uniting roller itself, if preferred, because the difficulties arising from the slackening up of the material occur more especially between the paste-rollers and the uniting roller.

I have shown the guides so adjusted vertically relative to the paste and uniting rollers that the unpasted sides of the strips touch the guides. I think this is the better plan, but I do not limit myself to such construction. The pasted sides may come in contact, if desired.

I do not limit myself to the details of construction described, for they may be considerably varied and still embody my invention.

I claim as new and desire to secure by letters patent—

1. The described method of covering boxes, consisting in simultaneously winding upon the box a plurality of strips with their pasted sides all facing one way, and with the strips overlapping, all substantially as described.

2. An apparatus for applying simultaneously a plurality of strips to a box, consisting of a rotatable box-support, reels for the strips, pasting mechanism, and guiding mechanism for the several strips, whereby they are caused to overlap, and a suitable supporting-frame, all substantially as described, whereby the strips are pasted, overlapped, and wound upon the box, as set forth.

3. An apparatus for applying simultaneously a plurality of strips to a box, consisting of a suitable supporting-frame, a rotatable box-support, reels for the strips, pasting mechanism, and laterally-adjustable guiding mechanism for the several strips, all substantially as described.

4. An apparatus for applying strips to a box, consisting of a suitable supporting-frame, a laterally adjustable and rotatable box-support, reels for the strips, pasting mechanism, and guiding mechanism, all substantially as described.

5. The combination of the pasting mechanism, the tempering-

rollers, and the laterally-adjustable rotary box-support, substantially as and for the purpose hereinbefore set forth.

6. The trimming and covering strip reels, placed one above the other and laterally adjustable with reference to one another, for the purpose of regulating the overlapping of the strips, in combination with the pasting mechanism and the tempering-rollers, substantially as and for the purposes hereinbefore set forth.

7. The combination of the pasting mechanism, the tempering-rollers, the trimming and covering strip reels placed one above the other and laterally adjustable with reference to one another, and the laterally-adjustable rotary box-support, substantially as and for the purposes hereinbefore set forth.

404 8. In a box-covering machine, a tempering or supporting roller for the pasted strip, fluted or ribbed for the purpose of reducing the surface with which the pasted side of the strip makes contact, substantially as hereinbefore set forth.

9. The method herein described of producing the compound covering and trimming strip from a plurality of strips in the roll, consisting in feeding the covering and trimming strips continuously along, and during their movement first automatically applying to one side or face of each strip paste, then bringing the several strips together, with their pasted faces all on the same side, and in such position that they shall overlap one another, and finally uniting them together in this position, thus producing a compound covering and trimming strip composed of a plurality of overlapping strips, and coated on one side or face only with adhesive substance, all substantially as hereinbefore set forth.

Signed at New York, in the county of New York and State of New York, this 6th day of March, A. D. 1883.

GORDON MUNRO.

Witnesses:

JOHN J. CAULDWELL.
PHILLIPS ABBOTT.

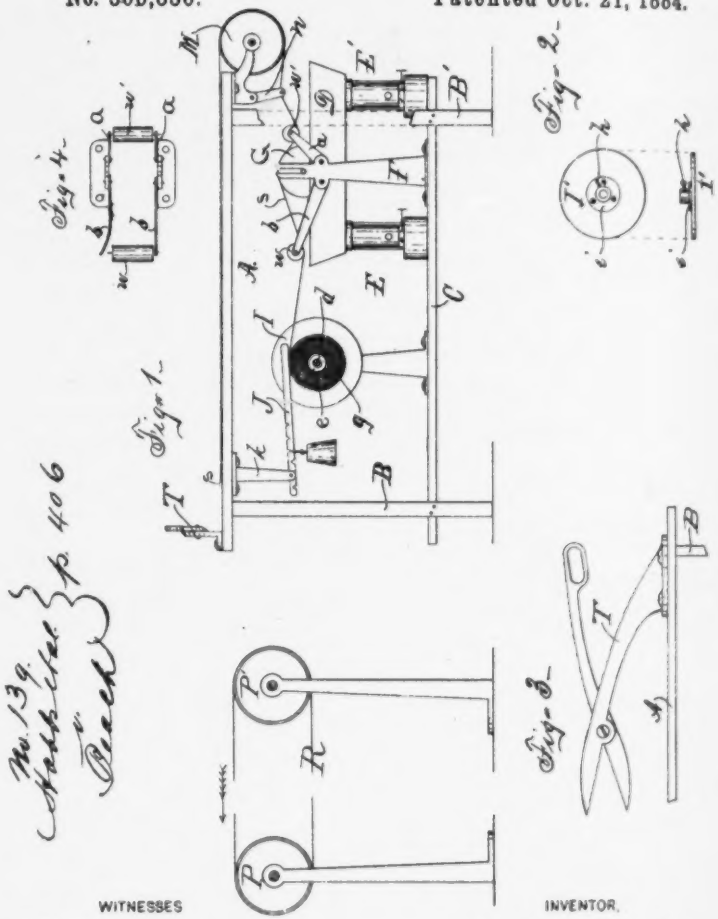
16576

(No Model.)

A. KINGSBURY.

PASTING MACHINE.

No. 306,836. Patented Oct. 21, 1884.



No. 139. Matthews p. 406 Brick

WITNESSES

W. W. Beckwith

Amos B. Smith

INVENTOR.

Addison Kingsbury

By his Attorney

Frank H. Allen

407 UNITED STATES PATENT OFFICE.

ADDISON KINGSBURY, of South Coventry, Connecticut.

Pasting Machine.

Specification forming part of Letters Patent No. 306,836, dated October 21, 1884. Application filed October 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, Addison Kingsbury, of South Coventry, Tolland county, Connecticut, have invented certain new and useful improvements in pasting-machines, which improvements are fully set forth and described in the following specification, reference being had to the accompanying drawings.

My improvements relate to a machine for automatically pasting or gluing one side of continuous strips of paper as used, chiefly, by paper-box manufacturers, my immediate object being to produce a machine which shall be simple, durable, easily operated, and quickly adjusted.

The invention consists in the construction and arrangement of parts, as will be hereinafter described, and particularly pointed out in the claims.

My device may be located either on or under a suitable table, a convenient form being shown in figure 1, in which the gluing mechanism is placed under the table proper, out of the way, the paper, after having been glued, being delivered on the top of said table.

(Here follows diagram marked p. 406.)

Fig. 1 is a side elevation of my device with the flange C removed. Fig. 2 is a detached view (side and top) of the removable flange provided to keep the roll of paper in place on the shaft *d*. Fig. 3 is a side elevation, somewhat enlarged, of the hand-shears used to cut the glued paper into any desired length. Fig. 4 is a top view of the arms which support my friction rolls, illustrating the method of springing said arms sidewise to remove the rolls.

A represents a table-top, supported by suitable legs, B B′, a second table or shelf being supported by said legs underneath table A to receive my gluing device.

D represents my glue-pan, which is supported by lamps E E′, said lamps being provided to keep the glue at a uniform degree of heat, so that it may flow freely.

At F is a standard arranged to support in suitable bearings my gluing-roll G, the lower side of which runs in the heated glue, the paper passing across its upper side and rotating said roll by friction, the paper as it travels being held firmly down on glue-roll G by friction-rolls *w w′*.

In the act of adjusting a new roll of paper or in cleaning up the machine it often becomes necessary to remove these friction-rolls

w w'; and in order that no time shall be lost I provide as bearings for said rolls arms *a b*, attached to standard F, and made of thin sheet metal of strength sufficient to support said rolls properly, but having lateral spring enough to allow the rolls to be removed, as shown in Fig. 4. The roll of paper *g* is held, not directly, on the rigid shaft *d*, but on an intermediate thimble or collar, *e*, which turns with the paper on the fixed shaft. This I find necessary, as without it the inner end of the coil of paper is inclined to wind around the shaft and soon stops the paper.

To support the roll of paper in proper position, I have provided flanges I I', made, preferably, of wood, with metallic bushings *i*, flange I being fixed rigidly to shaft *d* and flange I' fitting loosely on said shaft, adapted to be adjusted to different widths of paper and held in place by a suitable thumb-screw *h*. As the paper is drawn forward with an intermittent or irregular movement, it becomes necessary to provide a check to arrest the rotary motion of said roll, so that the paper shall at all times remain taut on the several other rolls. I find a convenient and cheap device for this purpose in the weighted lever-arm J, supported by the bracket *k*, and resting at its outer or free end directly on the roll of paper. The paper, as it leaves roll *g*, passes under friction-roll *w*, over glue-roll G, and under friction-roll *w'*. It now passes upward over a wire, (in bracket *n*,) said wire scraping off the surplus glue, which drips back into pan D. The paper is now conducted around pulley M and along the table-top to the operator, who sits or stands in the open space between the glue-machine table and the traveling endless apron R, which delivers the glued pieces to the box-coverers. Thus it will be seen that the glued side of the paper touches nothing but the scraper after leaving the glue-roll G, but is turned bottom (or glue side) up by the reversing-roll M and brought to the operator clean and whole.

In my new form of machine one girl or boy operates said machine, cutting strips for five or six coverers, working as follows: Taking hold of the end of the strip *s*, the operator draws it
408 forward through the bench-shears T, having, if necessary, a gage or guide to bring all the pieces cut to a uniform length. She now cuts it off and places it on the slowly-moving apron R, along the sides of which are sitting the several coverers, who, as said pieces are brought to them, remove them from the apron and apply them to the boxes.

If preferred, the apron R may be dispensed with and the cut pieces be placed on a table within easy reach of the coverers.

Having thus described my invention, I claim as new and wish to secure by letters patent—

1. The combination, with the pan D, the standard F, having roll G, and provided with pivoted arms *a b*, carrying the friction-rollers *w w'*, of the shaft *d*, collar *e*, and flanges I I', the former rigidly secured to the collar, the latter adjustable thereon by means of the thumb-screw *h*, substantially as specified.

2. The combination, with the pan D, the standard F, having the roller G, and pivoted arms *a b*, carrying the friction-rollers *w w'*, of

the shaft *d*, thimble *e*, rigid flange I, adjustable flange I′, bracket *n*, and the reversing-roll M, as shown and described, and for the purposes set forth.

3. The combination, with the thimble *e*, gluing device G D *w w′ n*, and reversing-roll M, of the bench-shears T, located at the delivery end of the table, as and for the purposes set forth.

ADDISON KINGSBURY.

Witnesses:

JOHN ISHUM.
FRANK H. ALLEN.

413 UNITED STATES PATENT OFFICE.

HORACE INMAN, of Amsterdam, New York.

Machine for Labeling or Covering the Tops of Boxes.

Specification forming part of Letters Patent No. 299,225, dated May 27, 1884. Application filed May 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, Horace Inman, of Amsterdam, in the county of Dutchess and State of New York, have invented a new and useful improvement in machines for labeling or covering the tops of boxes; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is a machine for labeling or covering the tops and bottoms of boxes.

(Here follow diagrams marked pp. 410 & 412.)

In the accompanying drawings, figure 1 is a side elevation of my improved machine. Fig. 2 is a detail view of a section on line *x x* of Fig. 3, showing the cutters and their operating mechanism. Fig. 3 represents a front elevation of the machine, the box-supporting frame being broken away to better illustrate the invention.

In these drawings, A A represent the end frames on which the working apparatus is supported. It is braced in any suitable manner, and upon the top are rods *a*, as in my reissued patent No. 10,286, granted February 13, 1883.

On the left-hand end of Fig. 1 is placed the roll of paper B, which is of suitable width for the boxes to which it is to be applied. Next in order on the same rods is the glue-pot C, provided with means for keeping the glue hot. In this is a roller, *c*, and a scraper *d*. Over these devices the web of paper is laid and receives the glue or paste. These devices are old in similar machines.

In order to lengthen the path of the paper without increasing the length of the machine, I have devised an approved appliance, by means of which the length of the web between the glue-box and the position of the box may be increased or diminished at will. This consists of a standard, *e*, which passes through a bar, 9, supported on the sleeves *f*, which slide on the rods *a*, these sleeves being the same as those in my aforesaid patent. The standard is held in the bar by means of a set-screw. On the upper end of the standard is a cross-bar, *g*, having upturned arms 11, in which is supported a roller, 13. Over this the web D passes. It will be plain that by raising or lowering the standard, the length of that part of the web between the glue-pot and the other end of the machine may be increased or diminished. From this upper roller the web passes down to a lower roller *h*. It is thus deflected upward and then downward, and this deflection over the rollers serves to prevent the paper from curling.

(No Model.) 2 Sheets—Sheet 1.

H. INMAN.

MACHINE FOR LABELING OR COVERING THE TOPS OF BOXES.

No. 299,225. Patented May 27, 1884.

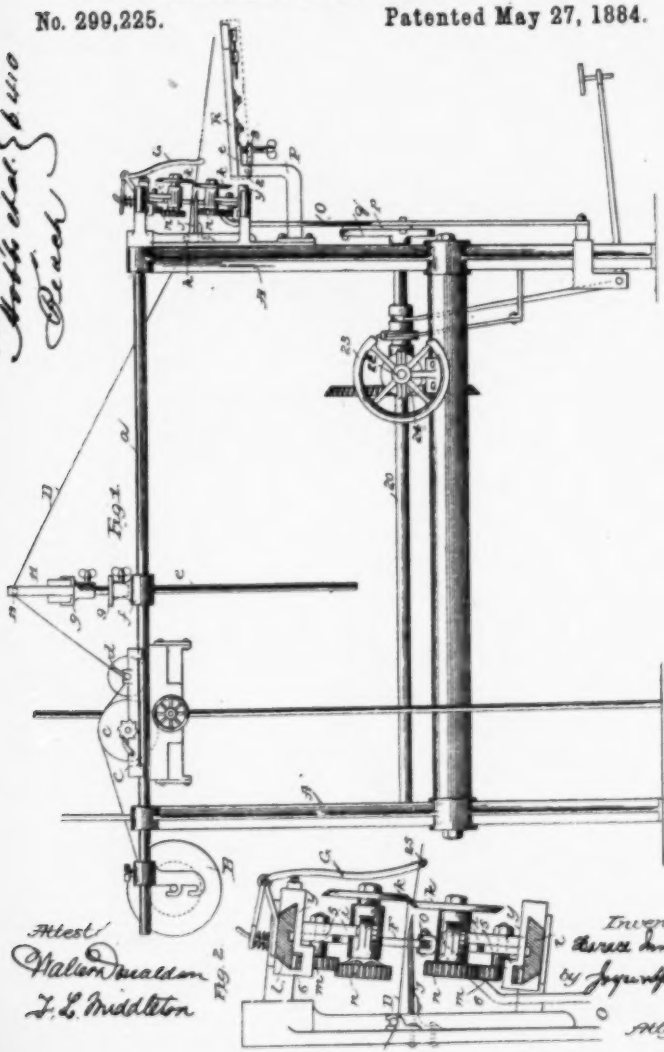


Fig 1.

Fig 2.

Attest/
Walter Malcolm
F. L. Middleton

Inventor
Horace Inman
by Joyce Kilmer
Attys.

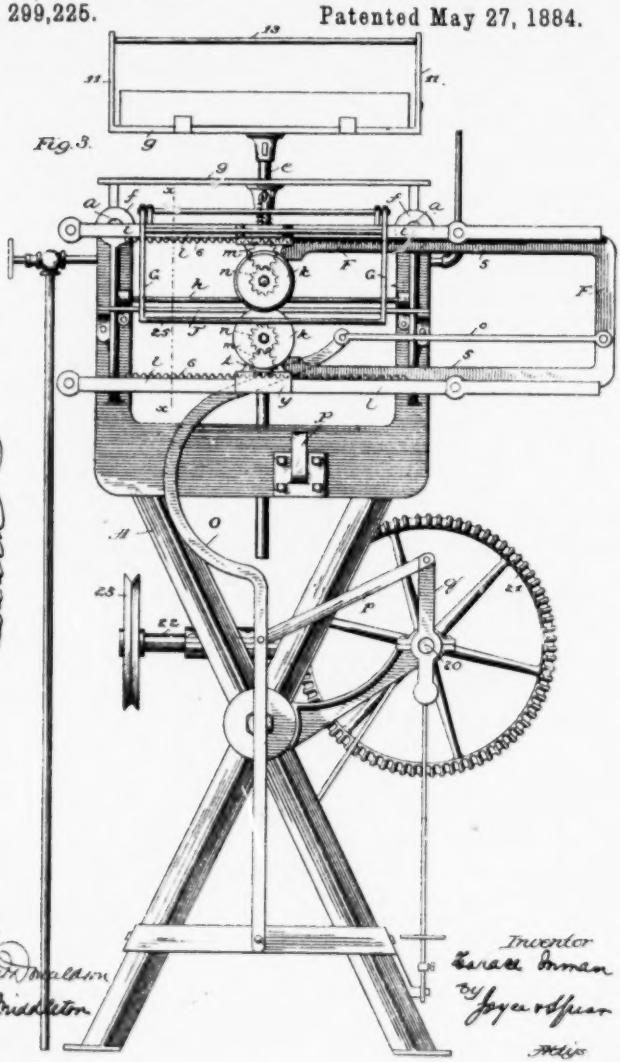
(No Model.) 2 Sheets—Sheet 2.

H. INMAN.

MACHINE FOR LABELING OR COVERING THE TOPS OF BOXES.

No. 299,225. Patented May 27, 1884.

Fig. 3.



Witnesses:
Walter Malcolm
F. L. Middleton

Inventor
Isaac Inman
by Joyce & Joyce
Attys

The length of the web between the glue-box and the end of the machine gives the paper time to soak up the glue and takes the stretch out of the web. At the front end of the machine I place the cutting mechanism. This may be of any ordinary construction; but I have devised a preferred form, which is shown more clearly in Figs. 2 and 3. This consists of a pair of cutting-disks, *k k*, which overlap slightly, and are carried in a reciprocating frame, F. The cutting-disks act as shears, and sever the web by passing across from side to side. It is necessary, in order to avoid dragging, and thereby tearing the paper, to give the cutting-disks a positive rotary motion, and the movement of the edges should be at least as fast as the lateral movement of the frame or carriage in which the cutting-disks are mounted. The leading feature, therefore, of this part of the invention lies in the laterally-moving frame carrying cutting-disks with mechanism for giving positive rotary motion to the disks, and with mechanism for laterally moving the frame. The mechanism found best for this purpose is shown in Figs. 2 and 3. In these figures, F is a frame or carriage open at the left-hand end. The arms 5 5 are provided with hangers *i i*, in which the cutting-disks *k k* have their bearings. These hangers have upon their ends grooved blocks *y y*, which receive the guideways *l l*, and slide thereon when the frame F is in motion. These disks are fast on their shafts, which project beyond their bearings, and are provided with pinions *n n* in line with rack-bars 6 6 on guideways *l l*, on which the supporting-frame moves. Loose pinions *m m*, on pins set in the frame F, connect the rack-bar with the cutter-pinions *n n*, and give motion to the cutters in the right direction. The pinions are so proportioned as to diameters that the rotary motion of the cutters will be equal to or greater (preferably equal) than the lateral movement of said cutters, so that tearing or dragging of the paper is prevented. The frame is connected to the guideways by means of the grooved blocks *y y*, which give it proper steadiness of movement and prevent any binding.

414 Movement may be imparted to the carriage by various mechanisms, such as a double screw, or by belts, or by a reversing screw, or other suitable reversible device. In the drawings is shown a lever, O, pivoted at the lower end upon the frame of the machine, and connected to the carriage-frame by a bar *o*. By bar *p* it is also connected to a crank-arm, *q*, of a shaft, 20. This shaft is driven through beveled gear 21 from a counter-shaft 22, which is provided with pulley 23 and bevel-pinion 24. Any suitable clutch device with treadle connections, as shown, may be used for operating the machine. It may also have any ordinary stop or clutch mechanism, by means of which the movement of the carriage, when it reaches either end, will throw the mechanism out of gear and stop the cutters. The better way is to adjust the devices so that the cutters will operate in both directions—that is to say, to move to one side and remain until required to cut again, then, by pressure on the treadle, they are started and cut in returning to the other side. Thus a half-revolution of the shaft carrying the crank takes place before the clutch or other stop mechanism is thrown out of

gear. When thrown into gear, a completion of the revolution carries the cutters back.

Underneath the web and just behind the cutters, but in the same plane with their meeting edges, is a supporting-plate, J. This prevents the paper from falling upon the mechanism for operating the cutters.

In front of the cutters is a supporting-frame, G, pivoted or connected above, and having a rod, 25, extending under the web. A spiral spring draws this back. The carriage, in passing each way, presses the frame forward, so as to bring the rod under that part of the web to be severed, and holds the paper while it is cut, and then the spring draws the frame back, letting the severed piece fall at once and evenly upon the box.

The box-supporting mechanism is mounted upon a bracket, P. The box-form R is of any suitable size, and is preferably extensible. It is fixed to the support *t*, hinged at 2 on bracket P. Underneath the hinged part *t* is an arm, 3, rigid on the bracket P, and in it is an adjusting-screw, extending up through the arm 3, to bear upon the part *t*. This is for the purpose of setting the box-form at any desired angle. It will be plain that the cutting devices must cut outside of the box; but it is necessary in many cases to leave more or less of margin between the edges of the covering or label and the edge of the box, for the purpose of showing the trimming on the box, and therefore to cut the piece shorter than the box. This is in part accomplished by inclining the cutting devices, as shown in Fig. 2; but a further and variable adjustment for the same purpose is obtained by means of the variable inclination given to the box-form. By inclining it more, the piece is cut shorter and drops, leaving a wider margin.

I am aware of the patent granted Orr and Wright, No. 67669, of August 13, 1867, which consists in the use of a continuous roll of paper, pasting devices, over which the paper is drawn, devices to sever the paper after it is wound around the box, devices for pressing the paper upon the box, and a revolving box-holder, the machine being adapted to cover the sides of a box by winding thereon a web of sufficient length.

Having thus described my invention, what I claim is—

1. A machine for labeling or covering the tops and bottoms of boxes, consisting of a suitable supporting-frame having bearings for the roll of paper, of paste or glue applying devices, non-revolving box, supporting devices and mechanisms for supporting and cutting the web, all substantially as described.

2. The combination of the bracket, the box-form pivoted therein, and the adjusting devices, substantially as described, whereby the inclination of the box may be varied, substantially as described.

3. In the described machine, the positively-operated cutters *k k*, adapted to move transversely across the web, substantially as described.

4. The transversely-moving carriage having rotary cutters, and pinions on the journals of said cutters, said pinions being connected

to rack-bars by intermediate loose pinions, whereby the cutters are made to revolve as the carriage moves, substantially as described.

5. The laterally-moving carriage having positively-revolving cutters, and a lever and suitable connections to a crank, in combination with devices, substantially as described, for stopping and starting the cutting mechanism, substantially as described.

6. In combination with the web-cutting devices, the frame F, and mechanism, substantially as described, to actuate the same, said mechanism being operated by the treadle-lever to throw the said frame forward and return the same, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

HORACE INMAN.

Witnesses:

L. W. SEELY.
JOHN B. THOMPSON.

427 UNITED STATES PATENT OFFICE.

EBENEZER B. BEECHER, of Westville, Connecticut, and ROBERT T. ELLIOTT, of Wilmington, Delaware, assignors to the Diamond Match Company of Wilmington, Delaware.

Machine for Making Match-boxes.

Specification forming part of Letters Patent No. 281,958, dated July 24, 1883; application filed July 27, 1882. (No model.)

To all whom it may concern:

Be it known that we, Ebenezer B. Beecher, of Westville, Connecticut, and Robert T. Elliott, of Wilmington, Delaware, have invented new and useful improvements in machines for making match-boxes; and we do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention is designed for making the drawer portion of what is commonly known as the "parlor match-box;" and it consists, mainly, in certain combinations of mechanisms adapted to act successively upon a paste-board strip and to produce therefrom complete and perfect boxes without hand manipulation.

It consists, further, in certain specific details of construction, which, in connection with the foregoing, will be fully described hereinafter.

(Here follow diagrams marked pp. 416, 418, 420, 422, 424, and 426.)

In the drawings, figure 1 represents a side elevation of our improved machine; Fig. 2, a plan view of the same; Figs. 3 and 4, detached views of the mechanism for applying the glue to the strip; Figs. 5 and 6, detached views of the mechanism for scoring the strip longitudinally and removing the excess portions of the same; Figs. 7, 8, and 9, detached views of the finger-bar mechanism for folding in the end pieces of the blank; Figs. 10 and 11, detached views of the rollers for scoring and cutting the strip transversely and for delivering the box-blank thus made to the box-forming mechanism; Fig. 12, a detached view of the side plunger-block mechanism; Fig. 13, a detached view of the former-block mechanism; Fig. 14, a detached view of the yielding portion of the bed-block I and the independent block i^3, forming a part of the same, by means of which the completed box is lifted to the plane in which moves the ejecting or discharging mechanism; Fig. 15, a detached view of the box-forming mechanisms; Fig. 16, a detached view of the mechanism for ejecting or discharging the completed box from the machine; Fig. 17, a view of that side of the paste-board strip to which the glue is applied; Fig. 18, a view of that side which is scored and cut; Fig. 19, a detached view of the cam b^{14}; Figs. 20, 21, 22, 23,

415 Beecher & Elliott Patent, No. 281,958. See Vol. I, page 59.

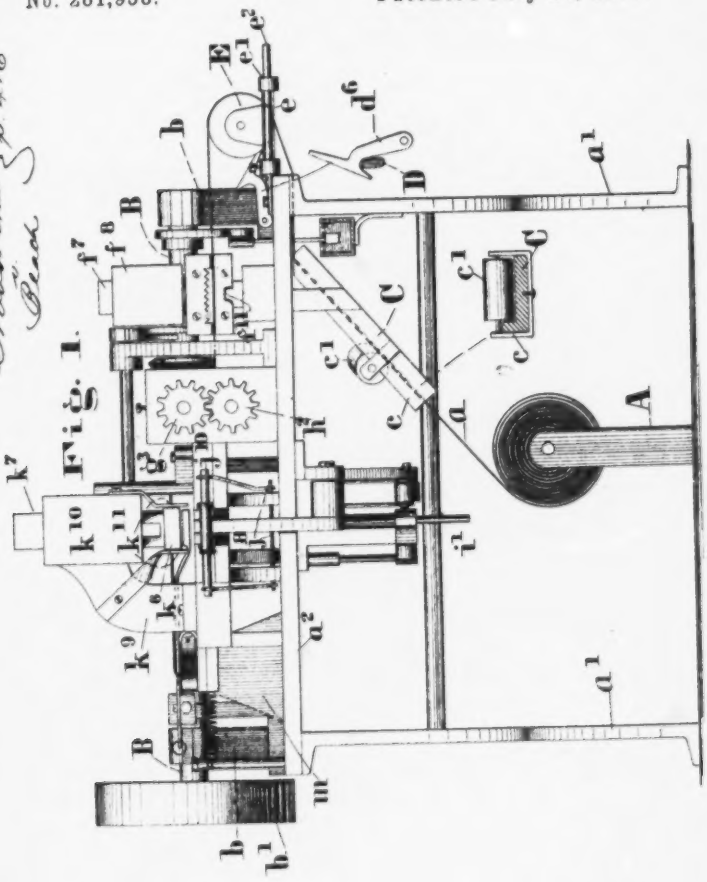
(No Model.) 6 Sheets—Sheet 1.

E. B. BEECHER & R. T. ELLIOTT.

MACHINE FOR MAKING MATCH BOXES.

No. 281,958. Patented July 24, 1883.

Fig. 1.



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Wm. J. Emerson

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H. W. Beadle & Co.
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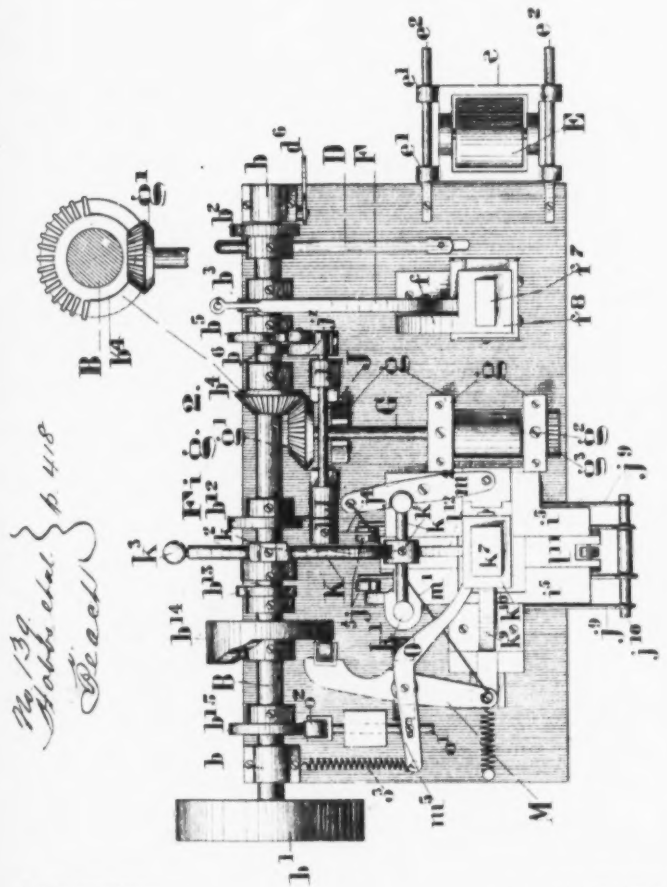
(No Model.) 6 Sheets—Sheet 2.

E. B. BEECHER & R. T. ELLIOTT.

MACHINE FOR MAKING MATCH BOXES.

No. 281,958. Patented July 24, 1883.



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(No Model.) 6 Sheets—Sheet 3.

E. B. BEECHER & R. T. ELLIOTT.

MACHINE FOR MAKING MATCH BOXES.

No. 281,958. Patented July 24, 1883.

Fig. 3.

Fig. 4.

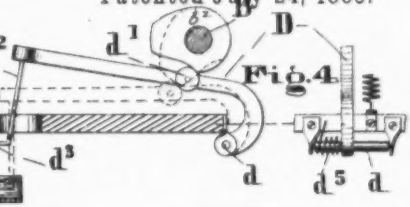


Fig. 5.

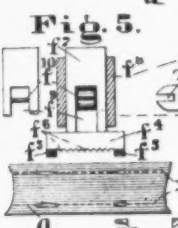


Fig. 6.

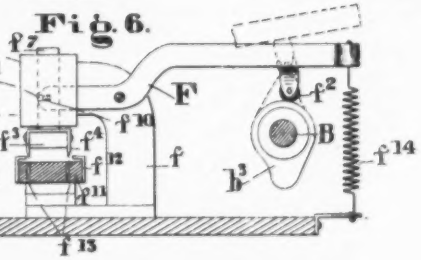


Fig. 7.

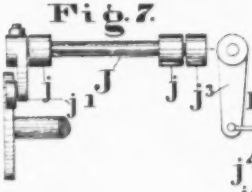


Fig. 8.

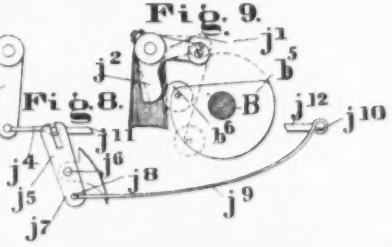


Fig. 9.

Fig. 10.

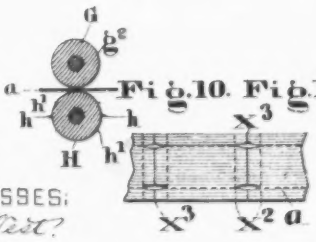
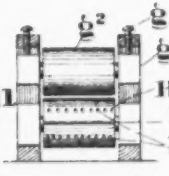


Fig. 11.



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(No Model.) 6 Sheets—Sheet 4

E. B. BEECHER & R. T. ELLIOTT.

MACHINE FOR MAKING MATCH BOXES.

No. 281,958. Patented July 24, 1883.

Fig. 12.

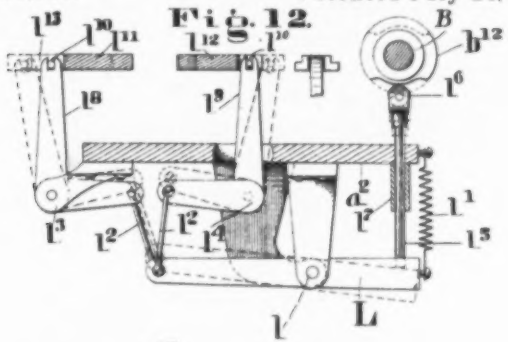


Fig. 13.

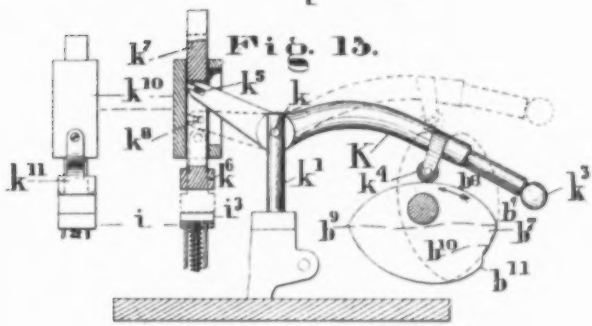
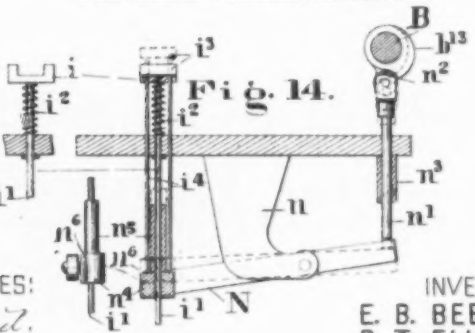


Fig. 14.



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(No Model.) 6 Sheets—Sheet 5.

E. B. BEECHER & R. T. ELLIOTT.

MACHINE FOR MAKING MATCH BOXES.

No. 281,958. Patented July 24, 1883.

Fig. 15.

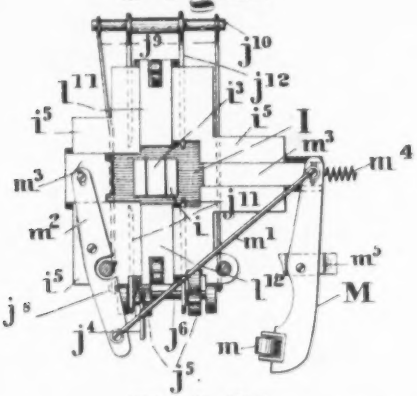


Fig. 16.

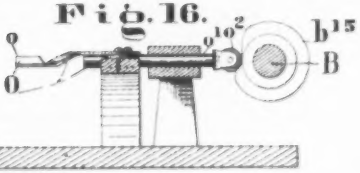
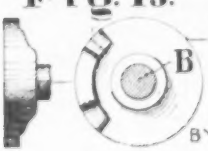


Fig. 17.

Fig. 18.

Fig. 19.



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(No Model.) 6 Sheets—Sheet 6.

E. B. BEECHER & R. T. ELLIOTT

MACHINE FOR MAKING MATCH BOXES.

No. 281,958. Patented July 24, 1883.

Fig. 20.

Fig. 21

Fig. 22

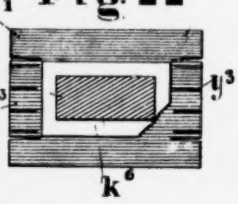


Fig. 23.

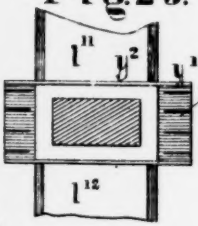


Fig. 24.

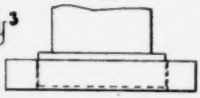


Fig. 25.

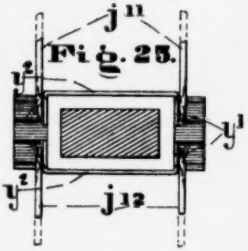


Fig. 26.

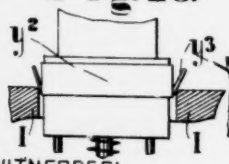


Fig. 27.

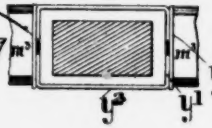
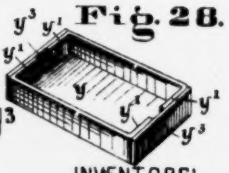


Fig. 28.



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24, 25, 26, and 27, views illustrating the formation of the box; and Fig. 28, a perspective view of the completed box.

To enable others skilled in the art to make our improved machine and properly use the same, we will proceed to describe fully its construction and manner of operation.

A, Fig. 1, represents a standard of any suitable construction, located at any proper point, which is adapted to support in any proper way a roll of pasteboard in such manner as to permit the same to revolve when the end of the continuous strip a is taken by the machine.

a' a' represent the legs or standards of the machine, and a^2 the table or frame plate supported thereby, which table serves as a foundation or base piece for supporting the other parts.

B, Figs. 1 and 2, represents the main shaft; supported above the table by proper bearing-standards, b b, which is provided at one end with the pulley b', for receiving movement from any suitable source of power.

C, Fig. 1, represents a guiding-plate suspended below the table, which is provided with a flange, c, on one side, and with an inclined roller, c', which latter serves to keep the edge of the pasteboard against the guiding-flange c as it moves forward toward the machine.

D, Figs. 2, 3, and 4, represents a bent arm, the rear end of which is provided with a transverse pivot-shaft, d, held in hangers depending from the rear edge of the table, as shown in Figs. 3 and 4, and which is provided near the rear end of its horizontal portion with a friction roller, d', and at its front end with a vertical rod, d^2, extending through a prop or opening in the table, this rod itself being provided with a horizontal portion, d^3, having vertical studs or fingers d^4, as shown.

d^5, Fig. 4, represents a spring of any proper construction, by means of which the arm is returned to its normal position after having been moved therefrom.

b^2, represents a cam upon the main shaft, which is adapted
428 at the proper time in the revolution of the latter to depress the forward end of the arm D against the action of the spring d^5.

By the depression of the front end of the arm D, the horizontal portion d^3 is caused to dip into a glue-box held in proper relation thereto, as shown in dotted lines, Fig. 3. By the lifting up of the front end of the arm, then, through the action of the spring d^5, when the latter is released by the cam, the horizontal portion d^3 is caused to apply by means of its fingers d^4 the glue taken by it from the box to the proper places upon the lower side of the intermittently-moving strip a, the latter being held stationary at this time to permit this action.

d^6, Figs. 1 and 2, represents a pivoted catch-arm, by means of which the front end of arm D may be held in its depressed position when the machine is not in use.

E, Figs. 1 and 2, represents a roller supported by proper bearings upon the plate e, having ears e' e', as shown; and e^2 e^2, rods extend-

ing from the table through the ears e' e', for the purpose of supporting the plate, as shown. Two of the ears e' are provided with set-screws, as shown in Fig. 1, for the purpose of securing the plate in any desired position. By means of this construction the roller may be adjusted nearer to or farther from the table for the purpose of varying the distance traveled by the strip, so that a longer or shorter time may be afforded for the cooling of the glue before the completion of the box, as may be necessary at different temperatures.

F, Figs. 2 and 6, represents a bent arm pivoted near its front end to the standard f, which arm is provided at its front end with a recess, f', Fig. 6, and near its rear end with a friction-roller, f^2, as shown.

f^3, Fig. 6, represents a quadrangular block, which is provided on each side with a plate, f^4, Fig. 5, having at each end a die, f^5, and in the space between the ends a series of teeth, f^6, as shown.

f^7 represents a vertical arm or shank rigidly secured to the block, which is adapted to slide in the guide-box f^8 of the standard f, as shown.

f^9 represents a recess in the arm f^7, and f^{10} a rod or pin adapted to lie in the recess f' of the arm F.

f^{11}, Fig. 6, represents a supporting table or bed located in line below the block f^3, which is provided with the side plates, f^{12}, having the overhanging flanges for guiding the pasteboard strip, and also with the die-openings f^{13}, corresponding in size and position with the dies f^5 upon the block f^3.

f^{14} represents a spring of any proper construction, by means of which the arm F is returned to its normal position after having been moved therefrom.

b^3 represents a cam upon the main shaft, which is adapted at the proper time in the revolution of the latter to depress the forward end of the arm F against the action of the spring f^{14}. By the descent of this arm the block f^3 is caused to cut out the excess portion x of the strip a and score the same on the lines x' x', Figs. 5 and 18.

G, Fig. 2, represents a shaft supported by proper bearings, g g g, rising from the table a^2, which is provided at its rear end with the bevel-gear wheel g', adapted to engage with the mutilated bevel-wheel b^4 on the main shaft, and provided near its front end with the roller g^2 and at its extreme front end with the wheel g^3, as shown.

g^4, Fig. 11, represents one of the journal-boxes of the roller G, which is capable of movement in a vertical direction, and g^5 an adjusting-screw by means of which the position of the journal-box may be determined.

H, Fig. 11, represents a roller held in bearings below the roller g^2, which is provided upon opposite sides of its circumference with a longitudinal cutting-blade, h, and two parallel scoring-blades, h' h', as shown in Figs. 10 and 11, and has at its outer end the gear-wheel h^2, as shown in Fig. 1.

By the revolution of the mutilated gear b^4 on the shaft B, an in-

termittent movement is given to the shaft G, having roller g^2, and by means of the wheel g^3 on this shaft motion is communicated by the gear-wheel h^2 to the roller H. By the movement of these rollers the strip of pasteboard is drawn from the roll before described above the part d^3 of the mechanism for applying the glue, before described, and below the die cutting and scoring mechanism before described into and through the rollers to the box-forming mechanism, the strip also being scored on the lines x^2 x^2 and cut on the line x^3 in its passage between the rollers. Complete severance is not effected by the cut on line x^3, sufficient material being left uncut to preserve the continuity of the strip until the end blank has reached its final position upon the bed of the box-forming mechanism. When this position has been reached, the separation of the blank from the strip is easily effected at the proper time by the action of the box-forming mechanism.

I, Fig. 15, represents the bed-block of the box-forming mechanism, which is located in a proper horizontal plane to receive the blank at the end of the strip, which is delivered thereto by the rollers g^2 H.

i, Figs. 14 and 15, represents a central movable portion of the bed-block corresponding in shape and size to the central portion, *y*, Figs. 20 and 21, of the box-blank, as shown.

i', Fig. 14, represents a rod depending from the central portion, and i^2 a coiled spring surrounding the rod, the lower end of which spring bears upon the table below and the upper end against the bottom surface of the central portion, as shown. By means of this construction the central portion, *i*, is adapted to yield in a downward direction, as indicated in Fig. 26, when pressure is brought to bear upon it.

i^3, Figs. 14 and 15, represents an independent block rest-
429 ing in a recess of the central portion, *i*, and forming a portion of the supporting-surface of the same, which block is provided with rods i^4 i^4, extending downward through the central portion, as shown. By means of this construction the block i^3, may be lifted by means of the rods i^4 i^4 out of the recess of the central portion at the proper time for the purpose of raising the completed box, which rests upon it, to that plane in which moves the lever for discharging the box from the machine.

J, Figs. 2 and 7, represents a shaft supported by proper bearings, *j j*, Fig. 7, rising from the table a^2, which is provided at one end with the bell-crank arms j' j^2, the former having a friction-roller, as shown, and at the other end with the arm j^3, as shown.

j^4, Figs. 2 and 8, represents a connecting-rod uniting the moving end of arm j^3 with the moving end of one of the arms j^5, rising from the rock-shaft j^6, as shown.

j^7 j^7 represent arms extending in a downward direction from the rock-shaft, which arms are united together by the transverse rod j^8, as shown.

j^9 j^9 represent connecting-rods, by means of which the transverse rod j^8 is united to the transverse rod j^{10} on the front side of the machine.

j^{11} j^{11} represent finger-bars extending from the upper arms of the rock-shaft forward toward the space above the central portion, and j^{12} j^{12} finger-bars extending from the transverse rod j^{10} rearward toward the space above the central portion. These finger-bars are so located relatively to the central space that the ends of the same are capable of an inward horizontal movement in vertical planes which are adjacent to the planes occupied by the end pieces y' y', Fig. 25, folded from the side pieces, y^2 y^2, as shown. By the action of these finger-bars the end pieces y' y' of the box-blank, at the proper time in the movement of the machine, are folded into the position occupied by them when the box is complete.

b^5, Figs. 2 and 9, represents a cam on the main shaft, which is adapted by contact with the friction-roller on arm j' to give the shaft J movement in one direction.

b^6, Fig. 9, represents a friction-roller on the same cam, which is adapted by contact with the arm j^2 to give the shaft J movement in the other direction. By means of this construction the shaft J is given an oscillating movement when the machine is in operation, and by means of this oscillation the finger-bars are advanced to fold in the end piece y' of the box-blank, which has been before delivered to the bed-block I by the rollers, and then withdrawn to permit the introduction of a new blank.

K, Figs. 2 and 13, represents a lever supported by the rock-shaft k, Fig. 2, held in proper bearings in the standards k' k', rising from the bed-block of the box-forming mechanism, which lever is capable of lateral adjustment upon the rock-shaft k, if desired.

k^2, Fig. 2, represents a set-screw by means of which the lever is rigidly secured in place when adjusted.

k^3 represents a balance-weight located at the lower end of the lever, by means of which the friction-roller k^4, located near the rear end of the lever, is kept in contact with its actuating-cam, hereinafter referred to.

k^5, Fig. 13, represents a recess in the front end of the lever, and k^6 a former-block having a vertical shank or standard, k^7, with transverse rod k^8 extending across a proper recess in the same, which rod is adapted to lie in the recess k^5, as shown.

k^9, Figs. 1 and 2, reresents a vertical standard having a guide-box, k^{10}, adapted to guide the shank of the former-block in its vertical movements.

k^{11} k^{11} represent fixed plates upon the guide-box, by means of which the completed box is pushed off from the former-block when the latter rises.

b^7, Fig. 13, represents the actuating-cam on the main shaft before referred to, which is provided with the incline b^8 terminating in the point b^9, and with the concentric portion b^{10}, terminating in the inclined portion of point b^{11}, the purpose of which will be hereinafter described. By means of this construction the rear end of the lever is elevated at the proper time, first to move the former-block k^6 down onto the supporting-bed, as shown in Fig. 22, for the purpose of holding the body y of the blank while the side plunger-blocks, l^{11} l^{12}, press in the sides, as shown in Fig. 23, and the fingers j^{11} j^{12}

fold in the end portions y' of the sides y^2, as shown in Fig. 25, and then to move the block below the horizontal plane of the supporting-bed, as shown in Fig. 26, the central supporting portion yielding to permit this action for the purpose of bending the end pieces of the blank, so that the same may be pressed to place by the action of the end plunger-blocks.

L, Fig. 12, represents a lever-bar pivoted to a shaft, l, held by proper bearing-standards depending from the table a^2, the rear end of which is united to the rear edge of the table by the spring l', as shown, and the front end of which is united by means of connecting-rods l^2 to the horizontal arms of the bell-crank levers l^3 l^4, hereinafter referred to.

l^5 represents a vertical rod, the lower end of which rests upon the rear end of the lever-bar L, which rod extends up through the table, and is provided at its upper end with a friction-roller, l^6, as shown.

l^7 represents a bearing-sleeve depending from the table, by means of which the rod is properly held and guided in its vertical movements.

l^3 l^4 represent the bell-crank levers before referred to, held in proper bearings on the lower side of the table a^2, and l^8 l^9 the vertical arms of the same, each of which is provided at its upper end with a recess, l^{10}, as shown.

l^{11} l^{12} represent the side plunger-blocks resting upon the
430 upper surface of the bed-block I, which blocks are provided upon their sides with projections extending into corresponding recesses in the fixed guide-pieces i^5 i^5, as shown.

l^{13} represents a recess formed in one end of the block, in which is held a rod adapted to lie in the recess l^{10} of the vertical arm of the bell-crank lever.

b^{12} represents a cam upon the main shaft, by means of which the vertical rod l^5 is given at the proper time in the action of the machine a downward movement against the action of the spring l'. By means of this construction the vertical rod is depressed at the proper time, and consequently the plunger-blocks, through the intermediate mechanism described, are caused to move forward and fold the sides of the box-blanks against the former, as indicated in Fig. 23.

M, Figs. 2 and 15, represents a lever-arm pivoted upon a proper bearing-block rising from the frame-plate a^2, which is provided at its rear end with a friction-roller, m, set at right angles to the arm, as shown.

m' represents a connecting-rod, by means of which the front end of the lever-arm M is united to the rear end of the lever-arm m^2 on the opposite side of the central space, as shown.

m^3 m^3 represent end plunger-blocks secured to the front ends of the levers M m^2, as shown, which are provided upon their sides with projections extending into corresponding recesses in the fixed guide-pieces i^5, as shown.

m^4 represents a spring of any proper construction, by means of

which the lever-arms of the plunger-blocks are returned to their normal position after having been moved therefrom.

b^{14}, Figs. 2 and 19, represents a cam on the main shaft, having a projection upon one side, by means of which the rear end of the lever-arm M is given, at the proper time in the action of the machine, a lateral movement in one direction against the action of the spring m^4. By means of this construction the cam is caused, through the intermediate mechanism described, to move forward the plunger-blocks at the proper time to press the end pieces y^3 y^3, Fig. 21, of the box-blank against the previously-folded end pieces y' y', for the purpose of completing the box, as indicated in Fig. 27.

N, Fig. 14, represents a lever arm pivoted to a proper bearing, a, below the table, as shown.

n' represents a vertical rod, the lower end of which rests upon the rear end of the bar N, which rod extends through the table, and is provided at its upper end with a friction-roller, n^2, as shown.

n^3 represents a bearing-sleeve depending from the table, by means of which the rod is supported in such manner as to move freely in a vertical direction.

n^4 represents an arm attached to the front end of lever-bar N, which is provided with a vertical sleeve, n^5, adapted to inclose the rod i' of the movable portion i, and with bearing-face n^6, adapted to bear against the lower ends of rods i', as shown.

b^{13} represents a cam upon the main shaft, by means of which the vertical rod n' is depressed at the proper time in the movement of the machine. By the depression of the vertical rod n' the rods i' are lifted against the action of gravity for the purpose of elevating the completed box above the horizontal plane of the foundation-bed.

O, Figs. 2 and 16, represents a striker-bar pivoted upon the block m^5, which is properly bent, and provided at its front end with a right-angled flange, o, as shown.

o' represents a horizontal rod, the rear end of which is loosely attached to the short end of the striker-bar, as shown, and the front end of which is provided with a friction-roller, o^2, as shown.

o^3, Fig. 2, represents a spring of any proper construction, by means of which the striker-bar is returned to its normal position to eject the box, after having been moved therefrom by the cam b^{15}.

b^{15} represents a cam on the main shaft, by means of which the horizontal rod is forced forward at the proper time in the movement of the machine. By the forward movement of the long end of the striker-arm, the completed box, which has been lifted above the horizontal bed, is discharged from the machine.

The operation is substantially as follows: The standard A, having been supplied with a roll of pasteboard of proper width, and the end of the same having been passed over the guiding-plate C and about the roller E to and through between the rollers g^2 H, the machine may be set in motion. Movement is communicated to the machine by means of the pulley b' from any proper source of power. As this shaft receives a uniform revolution, it follows that all the parts which are rigidly connected therewith will have also a con-

tinuous movement. The rollers g^2 H, however, which give movement to the strip, receive motion themselves through mutilated gearing g' b^4, and hence these remain stationary at regular intervals. The strip passes from the roll, as shown in Fig. 1, first to the guiding-plate C, when it is moved into the proper line to be acted upon by the various mechanisms which convert it into boxes, and then to the lower surface of the table, where the glue is applied at the proper points by the fingers d^4 of the lever D, the latter being elevated by the reaction of the spring d^5, as has been before described. The strip then passes around the roller E, which is adjusted nearer to or farther from the table, according as it may be desired to afford more or less time for the cooling of the glue before the box is made, and moves on between the supporting-bed f^{11}, Fig. 6, and the vertically-moving die-block f^3. By the depression of the die-block the excess portion x is cut out of the strip, and the lines x' are scored. The strip then passes between the rollers g^2 H, and by the action of the blades h h is transversely scored on the lines x^2 x^2, and by the action of the blade h' is partly cut
431 through on the line x^3. The rollers also deliver the box-blank, which is formed from the strip by their action, to the box-forming mechanisms. The operation of these mechanisms is substantially as follows: The box-blank is first advanced into such position upon the bed-block that its body portion coincides accurately with the movable portion i of the bed-block. The former-block k^6 is then caused to descend upon the body portion of the blank and remain stationary for an instant, while the side pieces, y^2 y^2, and the end portions y' y' are folded to place, as indicated in Figs. 23, 24, and 25. The former-block is then still further depressed, as indicated in Fig. 26, for the purpose of bending in the end pieces y^3 y^3, so that they may be folded to place by the end plunger-blocks, as indicated in Fig. 27. The descent of the former-block is caused by the passage of the inclined portion b^8 of the cam b^7 over the wheel k^4 of the lever K. Its movement is arrested when the point b^9 of the cam reaches the roller, and it is held stationary in this position while the concentric portion b^{10} of the cam is passing the roller. While thus held stationary the side plunger-blocks, j^{11} j^{12}, are advanced to fold in the side pieces, y^2 y^2, of the blank, this movement being effected by the reaction of the spring l' after the blocks have been withdrawn by the action of the cam b^{12}. During this period, also, the finger-bars j^{11} j^{12} are advanced to fold in the end pieces y' y' by the action of the cam b^5 and the shaft J and its attachments. The further descent of the former-block is effected by the incline of portion b^{11} of the cam b^7, the spring i^2, Fig. 14, of the movable bed-block yielding to permit this action. After the depression of the former-block, the end plunger-blocks, m^3 m^3, Fig. 15, are advanced to press to place the end pieces y^3 y^3 of the blank, this action being effected by the cam b^{15} acting on the lever M and its attachments. The end pieces of the blanks being provided with glue, this action of the end plunger-blocks serves to complete the box. After the box has been completed, by the advance of the end plunger-blocks the former-block rises to its upper

position, the box being disengaged from it by the action of the pusher-plates k^{11}, Fig. 1, as shown. The box itself is then lifted by the action of the independent block i^3 into the range of action of the ejecting-lever O, this movement of the block being effected by the action of the cam b^{13} upon the lever N and its attachments. By means of the ejecting-lever O the completed box is discharged from the machine. The striking action of this lever results from the reaction of the spring o^3 after the same has been expanded by the action of the cam b^{15} and the rod o'.

Having fully described our invention, what we claim as new, and desire to secure by letters patent, is—

1. In combination with the former-block k^6 and the cam b^7, having the incline of portion b^{11}, the end plunger-block, m^3, as described.

2. In combination with the bed-block i, the independent block i^3, for raising the completed box, as described.

3. In combination with the shaft J, having the arms j' j^2, and the cam b^5, the arm j^3, connecting-rod j^4, and finger-bar mechanism j^5 j^6 j^7 j^8 j^9 j^{10} j^{11} j^{12}, as described.

4. The box-forming mechanism, substantially as described, consisting, essentially, of a former-block mechanism having a vertical movement, a yielding bed-block mechanism, side plunger-block mechanism, finger-bar mechanism, and end plunger-block mechanism.

5. The combination of the following elements: mechanism, substantially as described, for applying glue to a continuous strip, mechanism, substantially as described, for scoring the strip in a longitudinal direction and cutting out the excess portions, mechanism, substantially as described, for advancing the strip with an intermittent movement, scoring and cutting the same transversely, and mechanism, substantially as described, for folding the blank thus formed into a complete box.

6. The combination of the following elements: mechanism, substantially as described, for applying glue to a continuous strip, mechanism, substantially as described, for scoring the strip in a longitudinal direction and cutting out the excess portion, mechanism, substantially as described, for advancing the strip with an intermittent movement and scoring and cutting the same transversely, mechanism, substantially as described, for folding the blank thus formed into a completed box, and mechanism, substantially as described, for lifting the completed box and ejecting it from the machine.

7. In combination with the former-block k^6 and mechanism, substantially as described, for giving it two distinct downward movements, mechanism, substantially as described, for folding in the side pieces after the first movement, and mechanism, substantially as described, for folding in the ends after the second movement.

8. The combination of the following elements: a former-block substantially as described, mechanism, substantially as described, for giving the former-block two distinct downward movements, and

and side plunger-blocks and finger-bars, with actuating mechanism substantially as described, and mechanism, substantially as described, for raising the completed box.

This specification signed and witnessed this 11th day of July, 1882.

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441 UNITED STATES PATENT OFFICE.

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Improvement in Paper-box Machines.

Specification forming part of Letters Patent No. 101,455, dated April 5, 1870; Reissue No. 6245, dated January 19, 1875; application filed September 18, 1874.

To all whom it may concern:

Be it known that Frederick Gates, now of Frankfort, in the State of New York, has invented certain new and useful improvements in paper-box machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the drawings accompanying and forming a part of this specification.

The invention consists, first, in combining, with an inserting-plunger or box-transferring mechanism of a box-forming mechanism, a series of box receiving and retaining receptacles, by means of which the partly-finished box is received from the box-forming mechanism and retained after the application of paste to its edges or corners, to enable it to become sufficiently dry before being delivered from the machine; second, in combining, with an inserting-plunger or box-transferring mechanism of a box-forming mechanism, a series of box receiving and retaining receptacles, a discharging mechanism for the purpose of discharging the boxes from the said receivers after the pasted portions of the boxes have become sufficiently dry; third, in arranging on the sides of these receptacles folding-plates, which are turned in to hold the gummed parts of the paper boxes securely together while they are in the receptacles to be dried, and which folding plates are swung out of the way when the boxes are to be discharged; fourth, in providing stationary plates, by which the aforesaid folding-plates of the receptacles are automatically swung in and out as the series of receptacles is in motion; fifth, in a novel mechanism for propelling the series of receptacles by means of a series of dogs attached to a horizontal plate; sixth, in the application of a reciprocating plunger, follower, and of side and end pieces or molds for forming a paper or pasteboard box; seventh, in a peculiar mode of combining the incisor, knives, and the blank-cutters; eighth, in the application of wire or slotted guides, on which the pasteboard or paper is supported during its passage from the feed-rollers to the cutting and molding apparatus, in combination with the feed-rollers set a convenient distance from the cutting apparatus to push the material toward the same; ninth, in the mechanism for operating the cutting-knife, whereby the same is thrown up immediately after having made an incision to allow the material to be moved forward after having been cut; tenth, in providing springs on the beds of the nicking-knives, to prevent

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Paper-Box Machines.

No. 6,245. Reissued Jan. 19, 1875.

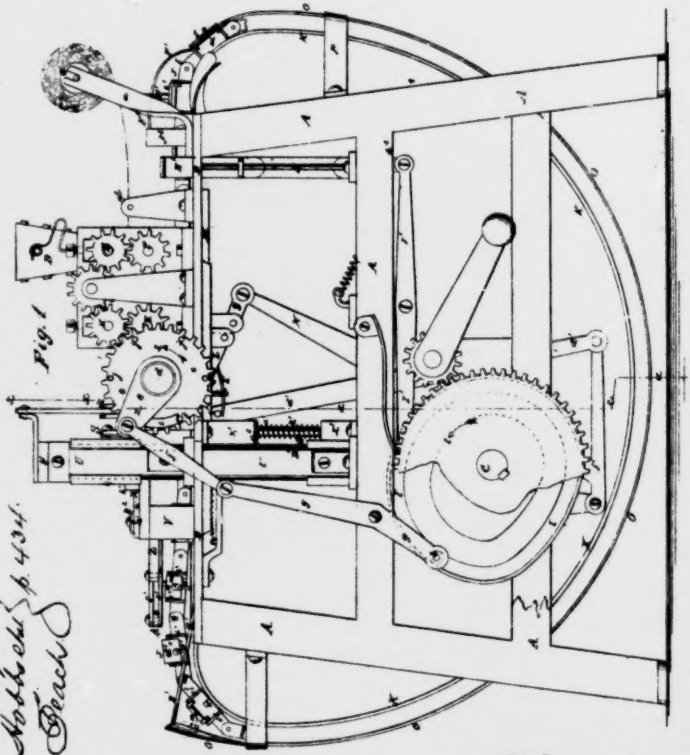

Fig. 1

No. 139, Models, p. 434.

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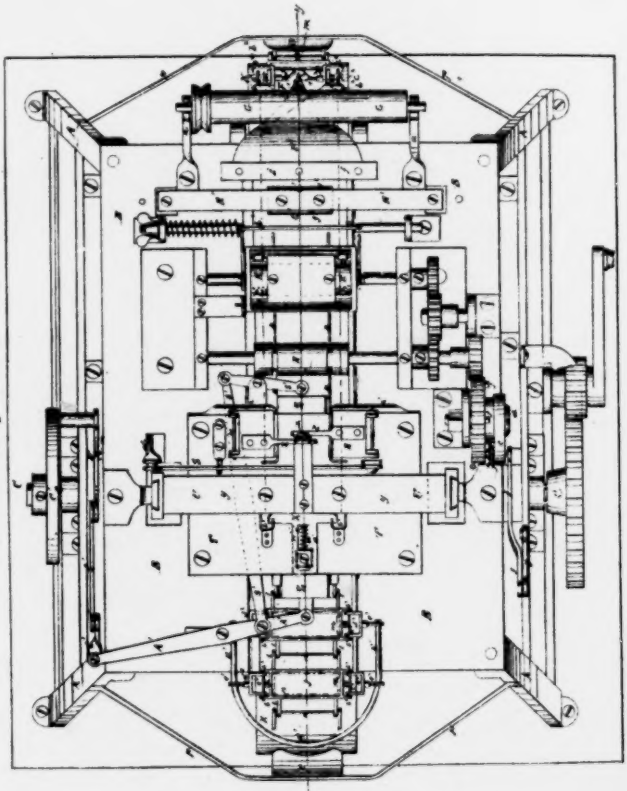

Fig. 2

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Fig. 3

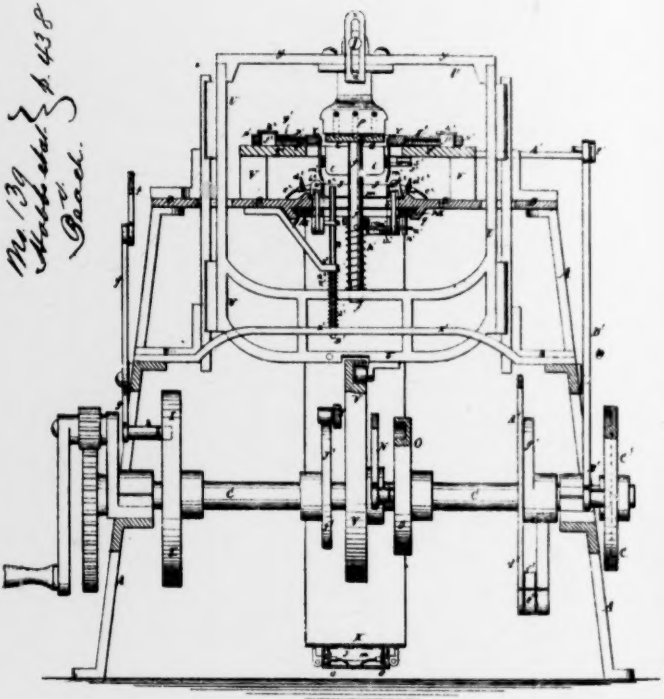
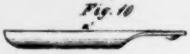


Fig. 10



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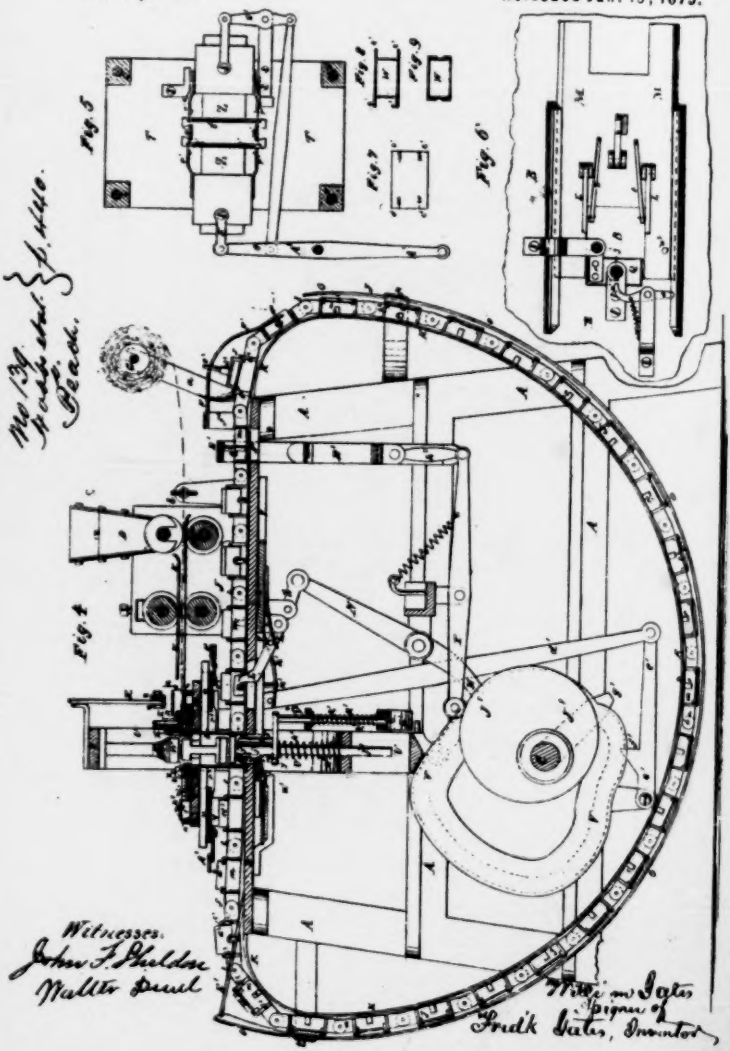

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Frank Gates
Signer of
Frank Gates, Inventor

them pushing the edges of the material down, said springs supporting and holding up the material while the knives pass through it; eleventh, in so attaching the end and side pieces of the mold that they can be readily removed and replaced; twelfth, in making the aforesaid end and side pieces of the mold so that they can slide, and in providing them with springs to have them pushed against the plunger while the same moves down, to hold the turned-up sides of the box in the proper vertical position; thirteenth, in the application of stationary side and end pieces below the sliding ones, for holding the sides of the box firmly against the plunger, and for preventing the plunger from drawing the box up again after said box has been deposited in the series of receptacles; fourteenth, in providing a series of horizontal folders, which turn the extremities of the sides of the box around the ends of the box, so that the parts thus folded will, when pasted to the ends, retain them and the sides in an upright position; fifteenth, in providing a mechanism for arresting the follower when it is pushed down, to allow the receptacles, with the newly-formed box, to pass over it, and in the use of devices for again disengaging the same when another receptacle has arrived over it; sixteenth, in combining the forming perforated plunger with a recessed follower, so that the box will not be apt to be drawn up.

(Here follow diagrams marked pp. 434, 436, 438, and 440.)

In the accompanying drawings, serving to illustrate the improvements, figure 1, plate 1, represents a side elevation of a paper-box machine. Fig. 2, plate 2, is a plan or top view of the same. Fig. 3, plate 3, is a vertical transverse section of the same, the plane of section being indicated by the line *x x*, Fig. 1. Fig. 4, plate 4, is a vertical longitudinal section of the same, the plane of section being indicated by the line *y y*, Fig. 2. Fig. 5, plate 4, is a detail inverted-plan view of the platform that supports the molding appa-
442 ratus. Fig. 6, plate 4, is an inverted-plan view of the feeding-plate, and of the device for holding the follower down. Fig. 7, plate 4, is a detail face view of a separated sheet from which the box is to be formed. Fig. 8, plate 4, is a detail plan view of a box whose sides and ends are turned up, but which has the side pieces not bent in. Fig. 9, plate 4, is a detail plan view of a finished box as made on the machine.

A represents the frame of the machine containing such improvements. It consists of suitable upright and horizontal side and cross bars, and supports a horizontal platform, B, upon which the main mechanism of the machine is secured. The horizontal driving-axle C has its bearings in the lower part of the frame A, and receives rotary motion, in the direction of the arrow 1, by suitable means. Upon the platform B is placed, near one end, the gum or paste box D, which is to deliver adhesive gum to a roller, E, that has its bearings in ears projecting from the platform directly above another similar roller, F, as shown in Fig. 4. The pasteboard, straw-board, or other material from which the boxes are to be made, is wound

upon a roller, G, that has its bearings in bars *a*, that project from the frame, as shown, said roller G being in rear of the gum-rollers. The main feed-rollers H H are in front of the gum-rollers, and on about the same plane with them. The material from the roller G passes first through a slotted guide-plate *b*; then between the rollers E F, to the feed-rollers, which push it forward toward the cutting and folding apparatus. The gum-roller E is protected at the middle, so that it will only come in contact with the gum at the ends, and has small indentations at these ends, which take up the gum to convey it to the pasteboard. The box material will, therefore, only be gummed at the edges and at certain required intervals. The gum and feed rollers receive their motion by suitable intermediate gearing from a toothed wheel, *c*, which is hung at the side of the frame, and which turns loose on its axle, *d*, Figs. 1 and 2. A crank, *e*, of said axle is, by means of a rod, *f*, connected with a lever, *g*, which is pivoted to one side of the frame, and which has a projecting pin or roller, *h*, fitting into a cam-groove of an eccentric, I, mounted on the shaft C. The crank *e* has a projecting spring-catch, *i*, working against pins *j*, that project from the wheel *c*. Thus, as by the action of the cam I the lever *g* is oscillated, the crank *e* will also be oscillated, and will impart intermittent rotary motion to the wheel *c* by means of the catch *i* and pins *j*, in the direction of the arrow 2, Fig. 1. Between the gum and feed rollers, and between the latter and the cutting apparatus, the material from the roller G is supported by and guided between slotted bars or double wire rods *k k*, as shown, which allow the feeding apparatus to be placed some distance in rear of the cutting and molding devices. The rollers F and H are grooved to admit these bars *k*. J represents a series of receptacles, which, in the present instance, are constructed as follows: The receptacles *m m* have projecting ears *l l*, through which the connecting-pins *n n* are fitted, as shown. Each receptacle *m* is as large as, and of the form of, a box to be made in the machine.

The series of receptacles so connected is placed longitudinally upon the platform B and around a curved plate, K, suspended from the same, as shown. An outer shield, *o*, secured by braces *p* to the frame A, support these receptacles and protect them under the plate K. From the end of each receptacle *m* projects a small block, *r*. These blocks serve as abutments for the feeding-pawls L, which are pivoted to a sliding plate, M, that is dovetailed between guide-ribs *q q*, Fig. 3, which project from the under side of the plate B, the pawls being held up by springs *t*. The plate M is, by a short link, *s*, Fig. 4, connected with a lever, N, that is pivoted to the frame A. A pin projects from the lower end of the lever N into a cam-groove of an eccentric, O, that is mounted upon the shaft C. As the shaft C revolves the lever N will be oscillated, and will move the plate M backward and forward. During the forward stroke the pawls L, fitting through slots of the plate B, strike the blocks *r* of a receptacle, *m*, and move the series of receptacles forward the length of one such receptacle. Thus the feed of the series is produced. The material from the roller G is, by the feed-rollers, conveyed to the

moulding apparatus under the reciprocating plunger P. Before reaching the same, however, it is subjected to the action of a pair of cutters, R R, and of a single cutter, S. The cutters R R are, by pins *u u*, pivoted to ears projecting from a platform, T, Fig. 2, that is by posts supported above the main platform B, as shown. The cutters R R are above on opposite sides of the paper or material, and each has two parallel cutting-edges, so as to make two short incisions *w w*, into each side of the material. The cutters R are actuated by a slotted rod, *x*, which connects them with the upper cross-bar *y*, to which the plunger P is secured. This cross-bar forms part of a vertically-reciprocating frame, U, which rests upon or is actuated by a cam, V, that is mounted upon the shaft C.

Whenever the frame U is drawn down it operates, by means of the rod *x*, the arms *z z* of the cutters R, and forces them thereby into the paper.

The outer—that is, the rear—edge of the elevated platform T carries two springs, a^1, which are pushed aside by the cutters R during their descent, and which serve as supports for the paper to be cut. These springs prevent the cut edges of the paper from being carried and bent down by the cutters

When the incisions *w* have been made by the cutters R the material is fed along under the plunger P until it strikes abutting ears or lugs b^1, that project from the platform T, as shown. Then
443 the cutter S is brought down and separates the end of the paper from the roll. The piece thus separated is illustrated in Fig. 7. It is of rectangular form, and has two incisions, *w w*, in each end, equidistant from each side.

The corner flaps c^1 formed by the incisions *w* in each blank W are gummed, while the spaces between them are not gummed. The knife S, which is at one end pivoted to the platform or frame, is at the other end connected by a rod, d^1, with a pivoted lever, e^1, which lever has a projecting arm, f^1, that is actuated by a crank, g^1, of the shaft C once during every revolution of the latter. Whenever the crank g^1 strikes the arm f^1 the knife S is suddenly brought down to cut off the blank W. As soon as the crank has passed the arm the knife is at once elevated by a spring, h^1, which acts against the under side of a pin, i^1, that projects from the rod d^1, as shown.

The knife is, by means of this spring h^1, raised to clear the material, so that it will not interfere with the further motion of the same.

In the platforms T and B are, directly under the plunger P, rectangular apertures, as large as the outside of the box to be made, while the lower face of the plunger is as large as the inside of said box.

A follower, Q, as large as the apertures in the plates B and T, or smaller, is arranged below the plunger, and has a shank, *j*, reaching downward into a cross-bar of the frame U.

A spiral or other spring, k^1, has the constant tendency to elevate the follower, and to hold it against the under side of the plunger. The sides and ends of the apertures through the plate T are extended downward by means of spring-plates *i i* and *m' m'*, which

are somewhat bent inward. Upon the plate T are, at the sides of its apertures, arranged plates or bars X X, which have shanks $n' n'$, that are fitted into grooved guides, or that, if slotted, as shown, are fitted around guides i^2, formed on said plate, and that are forced inward by means of springs $o' o'$, so that they form yielding sides above the aperture. In a similar manner are yielding ends provided on said aperture by means of plates or bars Y, which, with their shanks p', are fitted into grooved guides, or, when slotted, around inner guides, j^2, formed on the plate T, and which are forced inward by springs q'. The springs o' and q' are not very powerful, so that they will allow the plates X and Y to move outward as soon as the plunger moves down. The guides $i^2 j^2$ carry projecting top plates k^2, which serve as buttons for holding the plates X Y in place. By taking off these buttons the said plates can be readily removed. When a blank, W, has been moved forward against the plates b^1 the follower is thrown up by its spring k^1, so that its surface will stand flush with that of the plates X Y. The blank is larger than the follower, and rests partly on the plates X Y, as indicated in Fig. 3. A receptacle, *m*, of the series is under the aperture of the plate T, and above that of the plate B.

The cam V now draws down the plunger, which is pressed upon the follower, and which carries the blank down with it. The sides of the blank are thereby turned up with the corner of flaps c^1, as in Fig. 8, while the ends are also turned up between the sides, as shown. The aperture in the plate T has longitudinal extensions, to admit the passage of the corner pieces c^1. The plates X Y yield to the outward pressure of the plunger, but hold the vertically turned-up sides and ends of the blank close against the sides and ends of the plunger, and cause, by their inward pressure, sharp corners to be made by the plunger. The plunger and follower move steadily down until the face of the latter is a short distance below the lower side of the platform T.

On the under side of the platform T are horizontal slide-plates Z Z, one in front, and one in rear, of the plunger. From each of these slide-plates projects, toward the plunger, a pair of spring-plates, r', as shown in Fig. 5. The plates Z Z are, by means of links $s' s'$, connected with a pivoted lever, A′, in such manner that, when said lever is swung in the direction of the arrow 3, Fig. 5, they will be moved toward each other. The lever A′ is, by means of rods $t' t'$, connected with a lever, B, which is pivoted to the side of the machine, and which is oscillated by means of a cam, C′, of the shaft C.

When the follower and plunger are with their faces some distance below the platform T the slides Z are moved inward, so that their plates r' will strike against the extremities c^1 of the sides of the box, and will fold them over against the ends of the box. These pieces c^1, having been gummed, will adhere to the ends, and will, when the gum is dry, retain all parts in the position shown in Fig. 9.

In order to accommodate the folding of the corners c^1, the end spring-plates m' are made similar to inverted letters T, as shown in

Fig. 4, so that the plates r' will work above their heads in line with their shanks.

The plates r' are, by their slides, at once withdrawn after they have folded the corner pieces c^1. The plunger now continues its downward motion until the face of the follower is flush with the platform B, when the box will have been inserted in the receptacle m of the series. The follower is now, by a spring-catch u', that is pivoted to the under side of platform B, as in Fig. 6, and that fits over a shoulder or projecting spring, v', of the shank j, locked in this its lowest position, while the plunger again moves up.

The spring-plates l' m' spring in above the edges of the box as soon as the same has been deposited in the receptacle m of the series, and hold the box thereby down to prevent its being again drawn up by the ascending plunger. In the face of the follower is or may be formed a small depression, as indicated in Fig. 3, while the plunger is perforated, its apertures extending from the bottom through
444 the sides, as also shown in Fig. 3. When the plunger moves up the apertures through the plunger prevent the formation of a vacuum under it when it ascends, and the consequent elevation of the box. As soon as the plunger has moved up the series is moved ahead by the pawls L catching against the ears r of one of the receptacles m. The box is then carried in its receptacle m away from the follower, and another receptacle, m, is brought over the same. As soon as the new box-receptacle has arrived over the follower the catch u' is, by a pin, w', that projects from the slide M, turned so as to release the follower, which is, by its spring k^1, or by simple spring action, at once thrown up against the blank, which has in the meantime been deposited on the platform T under the plunger. Under the follower is arranged, in guides x' x', that project from the under side of the bed B, or from the frame A, a vertical slide-bar, D', which has at its upper end two projecting fingers, y' y', far enough apart to fit against the inner sides of a box-receptacle, m. A spring, z', has the tendency to elevate the bar D' in its guides. When, after the series has made a motion, the follower is thrown up by the spring k^1, the bar D' is also thrown up, so that its fingers fit into a box-receptable, m, as indicated in Fig. 4. These fingers have rounded ends, and will adjust the receptacle m in the proper position under the plunger, so that the place for the next box will be clearly defined. The upward motion of the bar D' is arrested by a shoulder or projection, a^2, of the latter striking against one of the guide-arms x'. When the follower is pushed down by the plunger it strikes against the upper ends of the fingers y', and forces them down with it, and holds them down under the platform, while it is locked by the catch u'. The adjusting-fingers are thus out of the way while the series of receptacles receives the box and during the motion of the series; but as soon as the pawls L have pushed the series their slide liberates the follower, and the finger-spring up under the follower to adjust the series in the proper exact position. To the ends of each box-receptacle m of the series are, in ears b^2, that project from the series, and by pins c^2, pivoted plates d^2, that can be swung out, as in Fig. 3, to be out of the boxes or into the

same. From each pivoted plate projects a pin e^2. When a receptacle, m, receives a box, the plates d^2 are swung out, and continue to be so until such receptacle arrives at the forward end of the platform B. There an inclined hoop, E′, is arranged on the platform, on which hoop the pins e^2 slide up, whereby the plates d^2 are gradually swung up and inward until they finally drop into the box. They then serve to hold the ends of the box against the ends of the receptacle, to prevent the end pieces c^1 from working loose while the boxes are conveyed along between the plates K and o. The boxes, as they pass slowly through this channel with the intermittent motion of the series, will become thoroughly dry, so that they will be complete and perfect when they again arrive at the rear end of the platform B. At the rear end of the platform is supported, on an elevated frame, f^2, a backward and downward extending plate, F′, which is pointed at its rear end, as shown in Fig. 2. The point of the plate F′ fits under the pins e^2 of the plates d^2 as the same arrive at the rear end of the frame, and as the pins e^2 slide up on the inclined plane of the plate F′ they are gradually elevated and thrown out, so that the plates d^2 will come out of the boxes. The boxes finally arrive over an aperture, g^2, of the platform B, and under a plunger, G, which is secured to a vertically-sliding frame, H, that is, by means of a rod, h^2, connected with a lever, I′, that is pivoted to the frame A, and operated by a cam, J′, of the shaft C. When a box arrives at the aperture g^2, the plunger G is moved down and discharges it from the machine. Thus, once during every revolution of the shaft C, the cutters R make their incisions, the cutter S separates a blank, the plunger, with the side and end plates X Y l' m', forms a box, and the series conveys one finished box away from the molding apparatus, and carries it to the discharge-opening. All these functions being performed simultaneously, or nearly so, a number of boxes are at once under course of construction, and by the continuous uninterrupted and entirely automatic action of the machine large quantities of boxes can in a short time be made with unusual accuracy, neatness, and dispatch.

It is evident that the operating-cams on the shaft C may be so shaped that the functions of the mechanism may be doubled, trebled, or furthermore increased during one revolution of the shaft, in which case a slower motion of the shaft would be required.

When the material on a roller, G, has been used up, another filled roller is readily put into its place, the bearings in the arm a being open at one end or side, to facilitate the removal and insertion of such rollers.

I claim—

1. The combination, with an inserting plunger of a box-forming mechanism, of a series of box-receptacles for the reception and retention of the boxes, substantially as described.

2. The combination, with an inserting plunger of a box-forming mechanism and a series of box receptacles, of a mechanism for automatically discharging the finished boxes from the box-receptacles, substantially as described.

3. The combination, with the box-receptacles m, of folding plates

d^2 d^2 and the inclines E′ F′, arranged and operating substantially as described.

4. The combination of the reciprocating plunger P and spring-follower Q with the sliding side and end pieces X Y, stationary spring plates l' m', and sliding lap-folders r' r', all arranged and operating substantially as herein shown and described.

445 5. The spring-supports a^1 a^1, arranged in combination with the nicking-knives R R, substantially as herein shown and described.

6. The side and end pieces X Y of the mold, arranged to slide on the platform T, and pushed in by springs o' q', substantially as herein shown and described, for the purpose of holding the sides and ends of the box firmly and vertically against the plunger.

7. The stationary side and end spring-plates l' m', arranged below the slide-plates X Y, for the purpose of forming the lower part of the mold, and for preventing the ascending plunger from elevating the finished box, as specified.

8. The horizontal folders r' r', in combination with spring-plates l' l' and plunger P, for the purpose of folding the ends of the sides of the box, so that the parts thus folded will secure all the parts of the box in the desired position, as set forth.

9. The spring-catch u', in combination with the pin w', arranged to arrest and disengage the follower, substantially as set forth.

10. The combination of a perforated plunger, P, with a reciprocating follower, Q, recessed upon its face, the latter supporting the blank, and the former bending its sides, while both descend a certain distance together, all as set forth.

WILLIAM GATES.

Witnesses:
WM. B. GATES.
J. F. SHELDON.

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UNITED STATES PATENT OFFICE.

ELISHA WATERS, of Troy, New York.

Improvement in Making Paper Boxes.

Specification forming part of Letters Patent No. 19270, dated February 2, 1858; Reissue No. 1212, dated July 9, 1861.

To all whom it may concern:

Be it known that I, Elisha Waters, of the city of Troy, county of Rensselaer, and State of New York, have invented a new and useful improvement in manufacturing boxes from thick paper-board, for which I did obtain of and from the United States of America letters patent bearing date the 2d day of February, 1858, which letters patent have been duly surrendered for the purpose of correcting errors in the specification thereof, therein incorporated through accident and mistake; I therefore hereby declare that the following is a full and exact description of my invention relating to said paper boxes.

The nature of my invention consists in an improved mode of manufacturing angular boxes of and from thick paper-board by cutting the board into strips for the sides, and into suitable pieces for the top and bottom, so as to form the upright angles or corners successively, by pressing the said strips or parts between angular dies, heated or cold, as desired, which may be somewhat facilitated by cutting, creasing, or scoring the same, which strips for the said sides are then cemented together at the ends thereof, after which the top and bottom pieces or parts are firmly secured in and to the said side parts, as hereinafter described and set forth, thus and thereby forming the main part of any paper box and the top or cover thereof, which, when done, complete a strong and durable paper box.

Like letters represent like parts.

To enable others skilled in the art to which my invention relates to construct and use the same, I will here proceed to describe the mode and operation of manufacturing angular paper boxes.

(Here follow diagrams marked pp. 448 & 450.)

Figures 1 and 2 represent a rectangular box constructed in the manner and by the machinery hereinbefore and hereinafter described and set forth.

Fig. 3 represents a strip or piece cut of suitable width and length to form each and every side of the box. This strip or piece has flanges B upon one edge thereof, to the inner side of which flanges the bottom C is firmly secured by cement or otherwise.

Fig. 4 represents a strip or piece corresponding from and by which the sides of the cover are made in like manner as the sides of the main or body part or section of the box represented by Fig. 3. The top F is therein firmly secured in like manner as the bottom C, above

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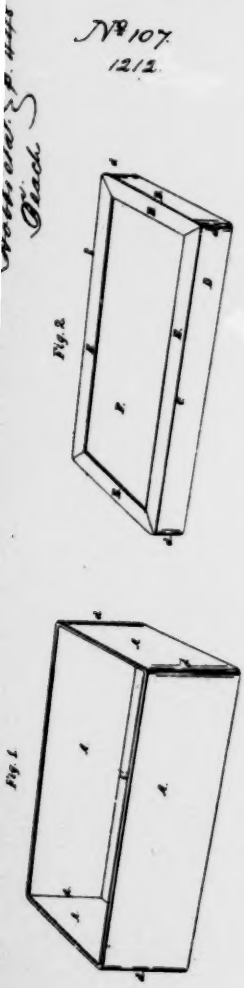

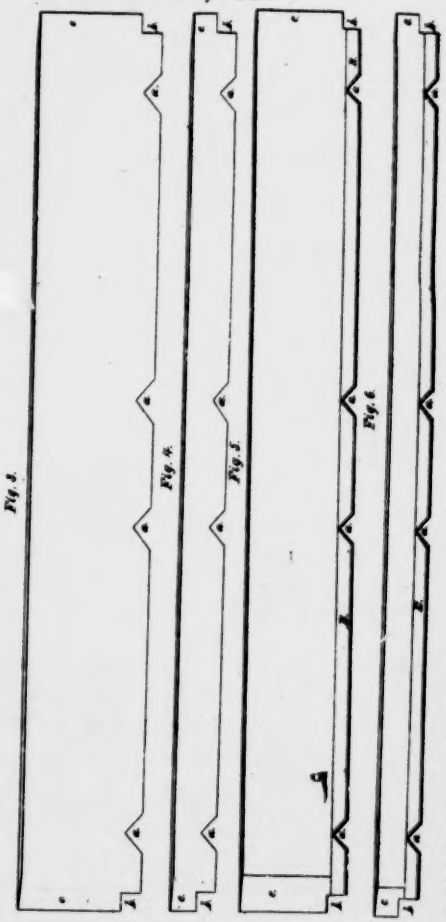

E. Waters. Sheet 2. 2 Sheets

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No. 107 1212.

Reissued Jul. 9. 1861

set forth and more fully described hereinafter. To enable the flanges to meet upon or near a miter-joint at the respective corners of the box, suitable notches, *a*, are cut therein for that purpose. The notches *b* are cut therein so as to allow the ends of said flanges to meet without hinderance when the chamfered ends *c* are lapped upon each other so as to cement and thus and thereby complete the sides of the main section or part of the box, or the sides of the cover for the same.

In this mode of making paper boxes I use a male and female die of the character shown at G and H in the different figures of the drawings. These dies or their equivalents are used for the purpose of successively forming the angles or corners of any paper box so that the same shall be strong and durable, which dies may be used in a heated or cold condition for this purpose, as deemed best by the operator or manufacturer. When the said angles or corners are thus turned or formed, they are then and thereafter pressed, thereby adding strength and giving them a better appearance.

In making a paper box of the character shown by Figs. 1 and 2, the strips or pieces for the sides thereof are prepared as shown at Figs. 3 and 4. Then and thereafter the flanges B and E are turned upon or formed into any required and convenient angle, and when turned upon or formed into a right angle will be as shown at Figs. 5 and 6, 8 and 11, which to accomplish I use the straight block-dies shown at Figs. 7, 8, 9, and 10, or the rotating circular dies seen at Fig. 11, or the equivalents of either or both, whereby the same mode of constructing boxes is carried out or executed. The straight dies may be mounted in any power-press, as shown at Fig. 10, in any such manner as to allow the said paper-board to be freely inserted between the same, as seen at the said Fig. 10, also at Fig. 7, which dies are then and thereafter brought to any required pressure against and upon the said paper-board thus inserted between said dies, thereby forming the desired angle, in the manner as hereinbefore stated.

In using the straight or block dies G and H they are so
452 arranged as to accurately fit each other, one being a male and the other a female. Then either or both may be made to operate as required in order to construct or form a strong angle out of and upon the material placed between the same for the sides of any box, by the use and arrangement of any machinery which will accomplish the desired end, which may be as represented at Fig. 10. The said dies must be brought together upon the paper-board under any pressure which will accomplish the work in a correct and satisfactory manner.

In using circular dies I mount them in respect to each other as shown at Fig. 11, with their journals turning in fixed or yielding boxes, which may be adjusted so as to allow various thicknesses of paper-board between them for the purpose of forming angles or corners. These dies may move separately or both move together with the same speed. P is an adjustable guide, against which the edge of the paper-board is placed in turning or forming the flanges, &c.

After turning or forming the flanges upon the required edge of the said strips or pieces for the said respective sides of the said box, I then form or turn the vertical corners or angles *d* in succession by means and use of the block-dies or their equivalents, in the manner shown at Fig. 9, so that these parts of the said box appear as shown at Figs. 12 and 13. Q Q′ are guides to place the back edge of the paper-board against in turning or making the corners *d*. Then the ends *c*, which before have been prepared by chamfering the same, are finally cemented together by any material which will do the same. Then the top and bottom pieces, F and G, are each placed in their respective places and there securely fastened by the use of any cementing material, which completes the construction of my improved paper box.

Paper boxes of any required or desired number of sides and angles may be constructed in the manner aforesaid, which to do requires dies to correspond to and with the angle or corner desired. These dies may be made of cast or wrought iron, or of any other material to answer the same purpose, and when heated for use may be of any desired temperature, and may be thus heated by means of the alcohol-lamp R under the female die, as shown at Fig. 10, or by any other means. If the said paper-board is very thick or unusually dry it should be moistened somewhat by means of water before turning or forming the angles or corners as aforesaid.

By this mode of making paper boxes any required number of different sizes and with many sides may be manufactured by the use of a simple set of the said dies and with the least waste of the paper-board, with smooth, solid, and upright corners, whereby the said boxes are greatly stiffened and rendered much stronger than otherwise made.

Paper boxes constructed as hereinbefore set forth are cheaper, stronger, and more durable than otherwise constructed, and at the same time require less waste of the paper-board and less amount of labor in constructing the same.

Goods or merchandise—such as collars, shirts, bosoms, drawers, lace, and the like—may be packed for market in such paper boxes with more safety and security than in any other kind. They may thus be adapted to any use when required.

Having thus described my invention and improvement in paper boxes, what I claim, and desire to secure by letters patent, is—

1. Angular boxes of paper-board constructed by cutting the said board into strips or pieces for the sides and into parts for the top and bottom thereof, forming the upright angles or corners one by one by pressing the said strips or pieces between male and female dies corresponding to and with the angle or corner to be turned or formed, substantially as herein described and set forth.

2. The flanges B and E, formed upon the sides A and D by pressing the paper-board or strip between dies, (in proper form,) thus and thereby constructing said flanges to receive and combine the same with the top or bottom of the said box, as herein described and set forth.

3. Forming the corners of paper boxes by pressing the same between cold or hot dies constructed for that purpose, as herein described and set forth.

In testimony whereof I have, on this 9th day of March, 1861, set my hand.

ELISHA WATERS.

Witnesses:

SAMUEL PIERCE.
M. H. GRATTON.

459 UNITED STATES PATENT OFFICE.

JOSEPH COHN, of New York, N. Y.

Improvement in Machines for Inserting the Corner-clasps of Boxes.

Specification forming part of Letters Patent No. 148,416, dated March 10, 1874; application filed January 20, 1874.

To all whom it may concern:

Be it known that I, Joseph Cohn, of New York city, in the county of New York, in the State of New York, have invented machines for inserting the corner-clasps of boxes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates to a machine for automatically inserting and securing the metallic corner-clasps in that kind of boxes for which letters patent were granted to me on the 21st day of November, 1871; and consists, first, in the combination, with a plunger or follower for forcing in the clasps, and a feed mechanism for supplying the clasps, one at a time, at the proper place to receive the action of said plunger, of yielding fingers, to support and steady the clasp during its descent into the box, and a holder or presser to hold in place and press upon the box corner during the insertion of the clasp; second, in the combination of a yielding bed or saddle, on which the box is rested, with clinching-jaws pivoted to a stationary supporting arm or frame, the whole arranged to operate so that said yielding bed supports the box-corner during the insertion of the clasp, and is then forced downward by the continued action of the inserting-plunger, to effect the upsetting or clinching of the points of the clasp; third, in a sliding and variable box-support and gage, which serves to support the material being operated upon, and to gage or regulate the location of the inserted clasps at the proper and regular distances from the top and bottom edges of the box, as will be hereinafter more fully explained.

To enable those skilled in the art to make and use my invention, I will proceed to more fully describe the construction and operation of my clasp-inserting machine, referring by letters to the accompanying drawings, in which—

(Here follow diagrams marked pp. 454, 456, & 458.)

Figure 1 is a side elevation; Fig. 2, a front view of my clasp-machine. Fig. 3 is a vertical cross-section at the line *x x*, Fig. 1, on an enlarged scale; and Figs. 4 and 5 are sections on a similarly enlarged scale at the line *y y*, Fig. 3.

In Fig. 4 the parts of the machine are drawn as they appear when the plunger is in its uppermost position, as seen at Figs. 1 and 2, while in Figs. 3 and 5 it is drawn with the plunger in its lower-

453 Cohn Patent, No. 148,416. See Vol. I, page 63.

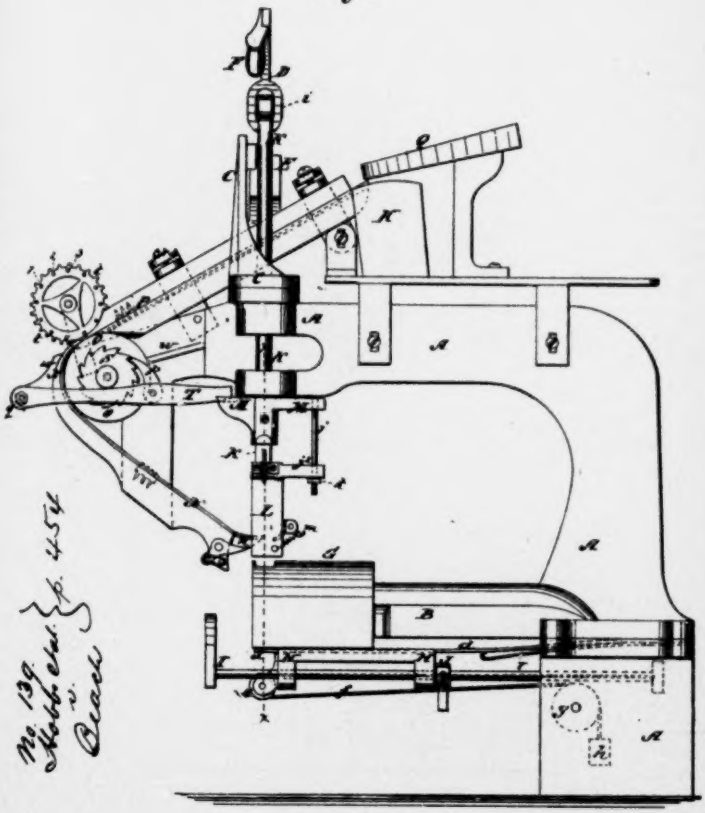
3 Sheets--Sheet 1.

J. COHN.

Machines for Inserting Corner-Clasps of Boxes.

No. 148,416. Patented March 10, 1874.

Fig 1.



No. 139. Hobbs et al. } p. 454
" " Black

Witnesses:
E. Wolff
Jacob Reber

Inventor:
Joseph Cohn
By att.
Dewey & Peters

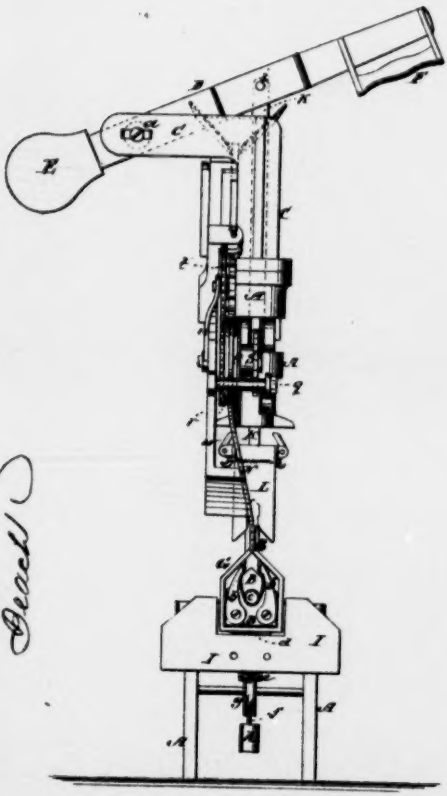
3 Sheets--Sheet 2.

J. COHN.

Machines for Inserting Corner-Clasps of Boxes.

No. 148,416. Patented March 10, 1874.

Fig. 2.



No. 139. Hicks et al. v. Beach. p. 456

Witnesses:
E. Wiff
Jacot Selbel

Inventor:
Joseph Cohn
By Attorney
J. Mac Turner

3 Sheets--Sheet 3

J. COHN.

Machines for Inserting Corner-Clasps of Boxes.

No. 148,416. Patented March 10, 1874.

Fig. 3.

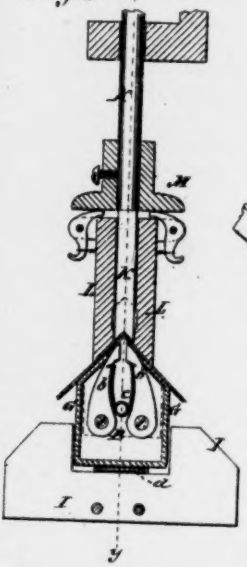


Fig. 4.

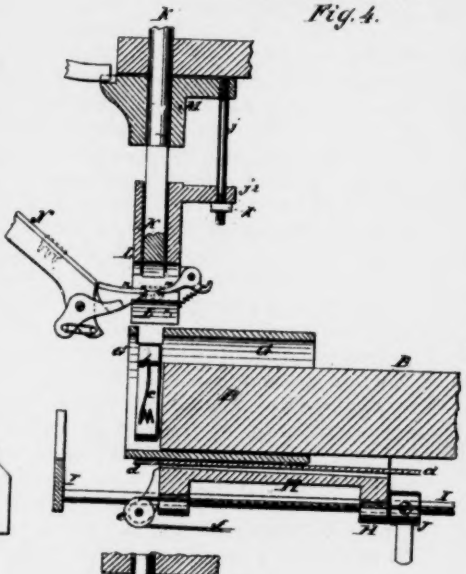
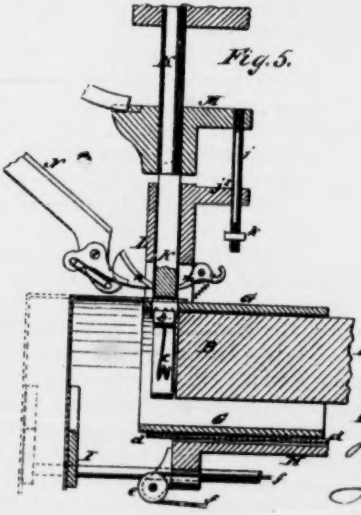


Fig. 5.



No. 139, Hobbs et al. 4458 Bench

Witnesses:
E. Hoyt
Jacob Fillsel

Inventor:
Joseph Cohn
By atty
J. Shumaker

most position, (as when the clinching of the inserted clasp is about effected.)

In the several figures the same part will be found designated by the same letter of reference.

A is the main frame or stand of the machine, to the upper forward part of which is bolted a vertical stand, C, in which is pivoted, at *a*, the power-lever D, which is provided at one end with a handle, F, and at the other with a heavy weight, E. The main frame has a horizontally-projecting arm portion, B, upon the end of which are arranged the clinching-jaws *b b*. These jaws are hung on horizontal pivots at the end of arm B, and are held open or in a distended condition by a spring-wire, *c*, placed between them. G is a yielding bed or saddle, which surrounds the forward portion of arm B, and the bottom of which rests on and is secured to the forward end of a strong spring-bar. *d*. Secured to the bottom of this saddle G, and to the same spring-bar *d*, is a stand, H, which carries the sliding box-supporter and the gage I, and also a pulley, *e*, round which passes the cord *f*, that is fastened at one end (in the rear) to the gage I, and has at its other end, just below the pulley *g*, a weight, *h*. This supporter and gage I is free to slide in its bearings in the stand H, and, by the gravity of weight *h*, is kept outward or distended, so that its stop *j* comes to a bearing against the back end of stand H. In the upper forward portion of the main frame A is arranged, in suitable bearings, a vertical reciprocatory shaft or plunger, K, the upper end of which is pivoted, at *i*, to the power-lever D, and the lower end of which is adapted to force in the clasp to be in-
460 serted. L is a presser-foot and guide-box, which surrounds the lower square portion of the plunger K, and which, when the plunger ascends, is lifted up by a rod, *j*. *k* is a nut, by the adjustment of which the lifting of the presser-foot L is regulated. In the lower portion of the presser-box L is arranged a spring-finger *m*, which, in conjunction with a spring-finger, *n*, on the lower end of feed-bar N, serves to support the clasp fed down until it is forced into the box by the plunger. This feed-bar N extends upward and partially round a guiding pulley or wheel, O, the periphery of which has in it a V-shaped groove, and from the upper portion of which runs off, at a tangent, the feed-trough P, to which the clasps are supplied from the hopper Q, (the surplus clasps falling into a box, R, very much after the fashion of the same devices in a spangling or in an eyeleting machine.) On the same shaft to which wheel O is keyed is fastened a ratchet-wheel, S, into the teeth of which takes a pawl, P, pivoted near the middle of a lever or arm, T, one end of which is hung on a pivot at *q*, and the other end rested on the stand M, (see Fig. 1,) and on this same shaft is keyed also a spur-gear, *r*, which meshes with a similar gear, *t*, mounted in the upper end of an arm, *u*, bolted to the forward projecting portion *w* of the frame of the machine. On one side of the wheel *t* are numerous projections or pins, 1 2 3, &c., arranged equidistant, and just far enough apart to pass successively between the points of the clasps as they come down in the trough P, and by the intermittent motion of this wheel *t* these pins 1 2 3, &c., feed the clasps one at a time to the bar N, on

which said clasps slide down to the fingers *m n*. (See Figs. 1 and 4.)

The operation of the machine is as follows: The hopper Q being supplied with clasps, the jar occasioned by the constant working of the weighted lever D causes said clasps to move along into the trough P, (those which happen to arrive at the mouth of the trough in a wrong position tumbling off into the surplus-box R,) and fill it full, the exit of the clasps from the lower end of trough P being regulated by the escapement-wheel *t*, with its pins 1 2 3, &c. Each time the plunger K ascends, the rear end of lever T is lifted by the projection or stand M, and the paw *p* of said levers turns the ratchet-wheel S one notch or tooth, and thereby the grooved wheel O and gears *r* and *t* are each simultaneously rotated to a given extent, just sufficiently to cause the pins on wheel *t* to pass along or move out one clasp from the lower end of trough P. The clasp thus fed out is, during its passage between wheel O and the curved part of bar N, turned over and passes along down or rides straddle of the feed-bar N by gravity, and lodges astride of or pendent on the fingers *m n*. This position of the clasp is illustrated by dotted lines at Fig. 4. As the plunger descends, the first operation is that of the presser box or foot L, which, losing its support by the rod *j*, comes down onto and holds the clasp in place on the spring-fingers *m n*. At the same time this presser-foot descends onto and holds in place the corner of the box, which is now supposed to have been placed over the saddle G. As the descent of the plunger K continues, the suspended clasp is carried or forced downward by its lower V-shaped end, and the points of the clasp are forced into and through the material of the box.

During this penetration of the points of the clasp into and their passage through the material of the box, the saddle G supports the box, the spring *d* (which supports said saddle) being stiff enough to withstand the pressure necessary to accomplish this insertion of the points of said clasp; but as the plunger continues to press down or descend it forces down the saddle G, (box inserted, clasp and all,) and, the oblique inner surface of the top sides of said saddles operating on the upper ends of the spring clinching-jaws *b b*, the latter, between which the downwardly-protruding points of the inserted clasp now depend, are forced together, and in their movement bend inward and upward and securely clinch the clasp-points on the inner surface of the box. This clinching of the points of the clasp (or upsetting them) between the top surfaces of the jaws *b b* and lower end of the plunger K is clearly illustrated at Figs. 3 and 5.

When the box or box portions are to be clasped, as just described, the operator places the corner in which the clasps are to be inserted over the saddle G and forward part of guide I, in such a manner that the bottom of the box or box-blank comes against the front board I, and thereby the placement of the inner portion or top edge of the box is regulated for the insertion of first clasp. He then forces along the box (pushing in the weighted guide I) until the desired point for the insertion of another clasp comes under the plunger K, and so on until the insertion of the last clasp, when the

front board of guide I is pushed home against the forward end of saddle G.

It will be understood that on the position to which stop J is adjusted will depend the distance of the first-inserted clasp from the top edge of the box.

I have found, in practice, that, with the machine described, the clasps can be as rapidly inserted as the operator can manipulate the box and machine, and that in the operation of insertion and securement the adjacent parts of the box will be held perfectly together, and the clasp be perfectly clinched.

461 Having so fully described my invention that any one skilled can make and use my machine for inserting corner-clasps of boxes, what I claim as new, and desire to secure by letters patent, is—

1. In combination with the inserting plunger or die and a clasp-supplying mechanism, the yielding holder-fingers *m n* and inclosing-case L, the whole arranged to operate substantially as described, for the purpose set forth.

2. In combination with the reciprocating plunger, a yielding supporting saddle or bed, and clinching-jaws pivoted to a stationary post, the whole constructed and arranged to operate substantially as and for the purpose described.

3. The sliding box-support, in combination with the box bed or saddle, operating as and for the purpose set forth.

In testimony whereof I have hereunto set my hand and seal this 17th day of January, 1874.

JOSEPH COHN. [L. S.]

In presence of—
A. ASCHER.
JACOB FELBEL.

465 UNITED STATES PATENT OFFICE.

AARON F. SMITH, of Lynn, Massachusetts.

Improvement in Machines for Forming Heel-stiffeners.

Specification forming part of Letters Patent No. 206,145, dated July 16, 1878; application filed June 3, 1878.

To all whom it may concern:

Be it known that I, Aaron F. Smith, of Lynn, of the county of Essex and State of Massachusetts, have invented a new and useful improvement in machinery for molding or forming heel counters or stiffeners for boot or shoe uppers; and do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

(Here follows diagram marked p. 464.)

Figure 1 is a top view, Fig. 2 a horizontal section, Fig. 3 a vertical and longitudinal section, and Fig. 4 a side elevation, of a machine embracing my invention.

In molding heel counters or stiffeners by means of dies it has been found difficult to obtain the desired convexity of the middle of the counter without unduly wrinkling the counter. In my improved machine the counter-blank is grasped and held along its upper and lower portions while the middle portion is being stretched and molded into shape.

Fig. 5 denotes a side view of a counter-blank as it appears before being subjected to the action of the machine. Fig. 6 is a side view, and Fig. 7 a vertical section, of a counter as formed by the machine. Figs. 8 and 9 represent, on an enlarged scale, sections of the dies and the counter-blank between them preparatory to the auxiliary male die being forced forward into the blank to stretch it into the female die.

My invention relates to or consists as follows, viz: In the combination of a movable main die, its spring or elastic cushion, an auxiliary or stretching die, a slide or carriage, and a female die, all being arranged and applied substantially in manner and to operate as hereinafter described; also, in the combination of a discharger and its spring and holding-screw with three dies, a carrier, and an elastic cushion, all being substantially as described and represented; also, in the combination of a central counter-blank movable supporter and its operative spring with a carriage and dies, as set forth; also, in a chambered holding-screw, provided with a spring-adjusting screw and ejector, in combination with a die and its elastic spring or cushion, all being essentially as shown and specified.

In the drawings, A denotes the frame for supporting the dies and their operative mechanism. These dies are represented at B and C, that marked C being the concave or female die. It is placed in a

A. F. SMITH.

Machine for Forming Heel-Stiffeners.

No. 206,145. **Patented July 16, 1878.**

Fig. 1

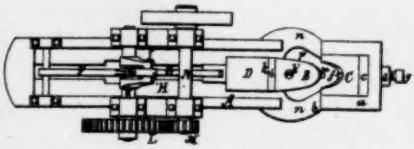


Fig. 5.

Fig. 2.

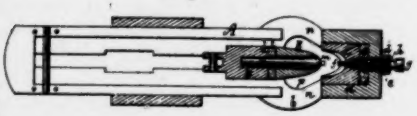


Fig. 6.

Fig. 3.

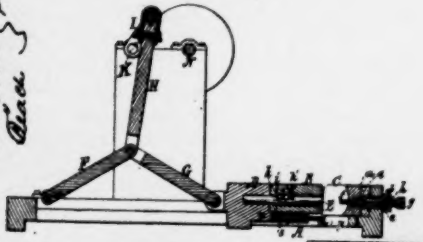


Fig. 7.

Fig. 8.

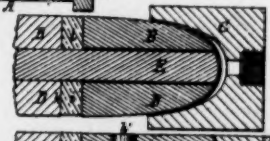


Fig. 4.

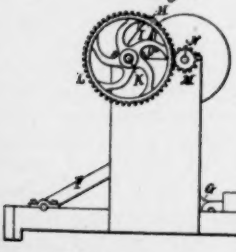
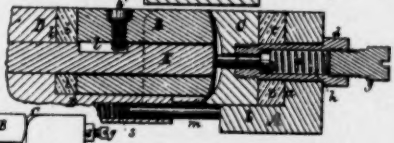


Fig. 9.



Witnesses.
A. H. Pope.
John Penner

Inventor
Aaron F. Smith
by his attorney
R. H. Eddy.

socket, *a*, of the bed *b* of the frame A, and rests against an elastic cushion, *c*. A screw, *d*, inserted in the frame and through the cushion and screwed into the die, serves to hold the die in its socket and allow the die to move backward. The screw is chambered to receive a helical spring, *e*, which bears against the head of a movable pin, *f*, such pin being arranged in the die and screw in manner as shown.

A screw, *g*, screwed into the rear end of the spring-chamber *h*, serves to hold the spring therein, and to contract it as occasion may require. The pin, through the pressure of the spring, operates to discharge from the mold or die the counter after the molding of it may have taken place.

The male or convex die (shown at B) is supported by and upon a slide or carriage, D, adapted to the frame, so as to be capable of moving rectilinearly therein toward and from the die C. At its heel the die B rests against springs or an elastic cushion, *i*, intervening between it and an abutment or shoulder, *k*, of the carriage D. From the central part of such abutment an auxiliary die, E, projects, and extends loosely through the die B. A screw, *k'*, screwed down in the die B, enters a groove, *l*, in the shank of the auxiliary die, and with such groove limits the advance of the die B on the die E, and allows the said die B to move backward in the die E.

A movable stud, *m*, extending from the middle of the front end of the slide or carriage D, and arranged to slide back within the carriage and against a spring, *s*, placed therein, serves to support a counter-blank at the middle of its lower edge preparatory to and while such blank may be in the act of being pushed into the female die by the male die, the blank being placed edge downward on the stud and on the parts *n n* of the bed *b* of the frame.

When the stud *m* is forced against the female die during advance of the male die, such stud will remain stationary and the last-mentioned die will continue to advance. The spring will advance the stud when the male die may be in the act of
466 being drawn backward out of the female die. Toggles F G are pivoted to the frame and the die-carriage, and together, and to a connecting-rod, H, which in turn is pivoted on the wrist of a bell-crank, I, carried by a shaft, K. On this shaft a gear, L, is fixed, and engages with a pinion, M, carried by a driving-shaft, N, all being arranged as represented. During each revolution of the bell-crank the toggles will be worked so as to cause an advance and recession of the die-carriage.

On placing a blank between the dies, it, during the next advance of the male die, will be forced into the female die, and, to a certain extent, will be molded or shaped by such dies. They, however, will grasp it firmly along and near to its upper and lower edges, after which the carriage, continuing to advance, will force the auxiliary die forward against the blank and stretch such blank between the grasped portions of it, and finish the curving of it at its center or heel.

On recession of the carriage both the auxiliary die and the male

die will be retracted, so as to cause them to separate from the female die far enough to allow the spring *e* to press the pin *f* against the formed counter and eject it from the die.

By having the female die movable against an elastic cushion, such die can accommodate itself to counter-blanks of different thicknesses. Each of such blanks should be firmly grasped by the dies B C before the auxiliary or stretching die E may be moved forward within and relatively to the male die B. Thus it will be seen that, with the three dies B C E arranged and to operate as described, I can stretch and crown the blank at its middle without materially or injuriously wrinkling such blank at either or both of its edges.

The bed-plate is provided with an opening or passage, *p*, extending down through it and arranged under the dies, and made of a width and form sufficient to enable the counters, as they are molded, to be discharged into and down through it.

What I claim as my invention is as follows:

1. The combination of the movable main die B, its spring or elastic cushion *i*, the auxiliary or stretching die E, the slide or carriage D, and the female die C, all being applied and to operate substantially as set forth.

2. The combination of the discharger *f* and its spring *e* and holding-screw *h* with the three dies B C E, the carrier D, and the elastic cushion *c*, all being applied and to operate substantially as explained.

3. The combination of the central counter-blank movable supporter *m* and its operative spring *s* with the carriage and the dies B C, arranged and applied as set forth.

4. The chambered holding screw *d*, provided with the spring *e*, adjusting screw *g*, and ejector *f*, in combination with the die C and its elastic spring or cushion *c*, all as set forth.

A. F. SMITH.

Witnesses:
R. H. EDDY.
JOHN R. SNOW.

4 Sheets--Sheet 1

H. H. BIGELOW.

HEEL PRESS.

No. 105,030. Patented July 5, 1870.

No. 139. Heels etc. p. 468 Trade

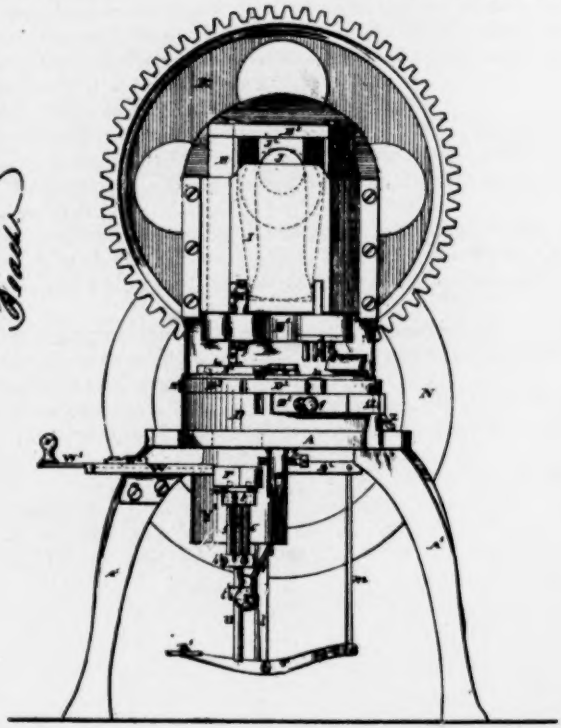


Fig. 1

Witnesses

Thos. H. Dodge

A. Edmunston Houghton

Inventor

Horace H. Bigelow

16614

4 Sheets—Sheet 2.

H. H. BIGELOW.

HEEL PRESS.

No. 105,030. Patented July 5. 1870.

No. 139. Hobbs and Black. July 5. 1870.

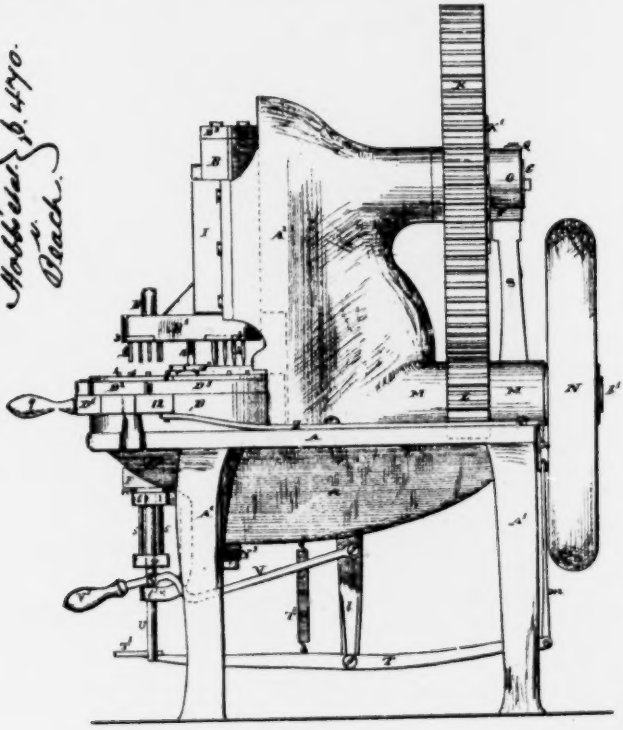


Fig. 2.

Witnesses,

Thos. H. Dodge

A. Emerson Hartlett

Inventor

Horace H. Bigelow

4 Sheets—Sheet 3.

H. H. BIGELOW

HEEL PRESS.

No. 105,030. Patented July 5, 1870.

No. 139. Hobbs Cla. p. 472 v. Beach.

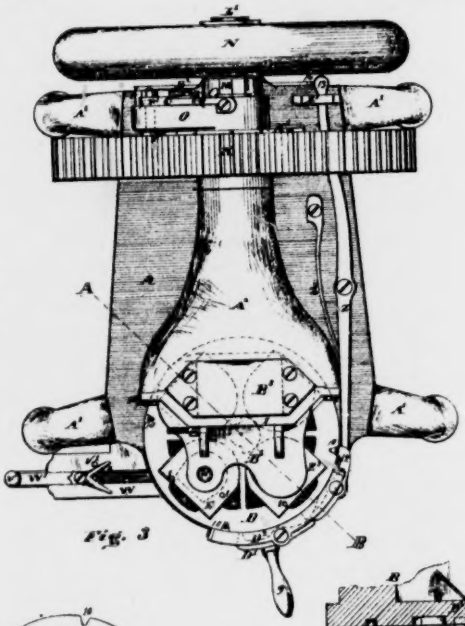


Fig. 3

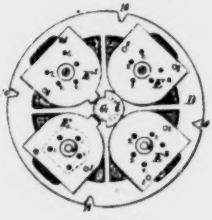


Fig. 4

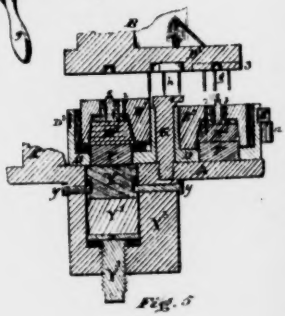


Fig. 5

Witnesses

Thos. H. Dodge

J. Emerson Hastham

Inventor

Horace H. Bigelow

16616

4 Sheets—Sheet 4.

H. H. BIGELOW.

HEEL PRESS.

No. 105,030. Patented July 5, 1870.

Fig. 13

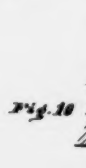


Fig. 10

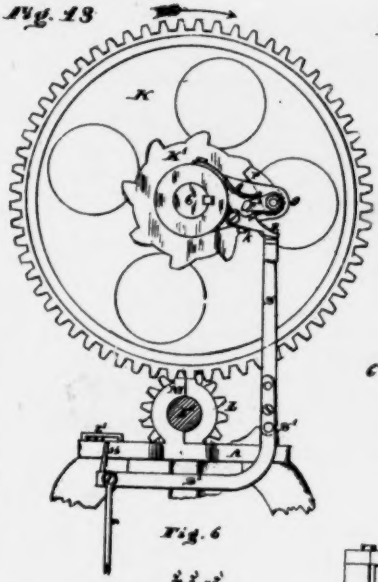


Fig. 6

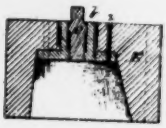


Fig. 9

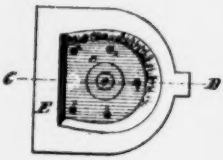


Fig. 8

Fig. 11

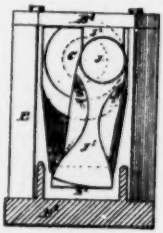


Fig. 7

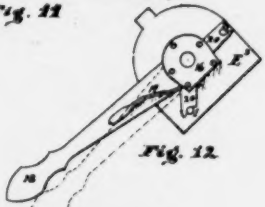


Fig. 12

No. 139. Mott's etc. ⅞ 47/44 Beach.

Witnesses,

Thos. H. Dodge

J. Emerson Worthington

Inventor.

Horace H. Bigelow

475 UNITED STATES PATENT OFFICE.

HORACE H. BIGELOW, of Worcester, Massachusetts.

Letters Patent No. 105,030, dated July 5, 1870.

Improved Heel-press.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Horace H. Bigelow, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful improvements in heel-presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

(Here follow diagrams marked p. 468, 470, 472, & 474.)

Figure 1 represents a front view of my improved heel-press;
Figure 2 represents a side view of the same;
Figure 3 represents a plan view of the same;
Figure 4 represents a plan view of the dye-cylinder and dies;
Figure 5 represents a vertical section through the dies and cylinder on lines A B, Fig. 3;
Figure 6 represents a rear view of the stop device.
Figure 7 represents a front view of the operating eccentric and its connections with the plunger;
Figure 8 represents a bottom view of one of the heel-dies;
Figure 9 represents a central vertical section of one of the heel-dies, on line C D, Fig. 8;
Figure 10 represents a central vertical section of the discharging-punch;
Figure 11 represents a side view of the nail-holder;
Figure 12 represents a plan view of the nail-holder, showing the manner in which it is placed upon the die; and
Figure 13 represents a plan view of one of the follower blocks.

My invention relates to certain improvements in machines for pressing and forming heels for boots and shoes, and for other purposes, as will be hereafter explained.

In the drawing, the part marked A is the bed or table of the machine, which is supported at a proper height upon legs A^1, and is provided with a strengthening flange, *a*, along its lower side, while from its upper side projects an upright frame, A^2, for supporting the stamping-plunger B and eccentric driving-shaft C.

Upon the table A, at its forward end, and underneath the stamp B^1, is arranged, in a horizontal position, a revolving cylinder, D, which carries the forming-dies E E^1 E^2 E^3, said dies being disposed n the cylinder D, as indicated in Figs. 3, 4, and 5.

The cylinder D is secured to the table A by means of a vertical pintle-bolt, G, which passes through the center of the cylinder D, and screws into the table A in such a manner that the cylinder is permitted to revolve freely around the pintle, but is allowed no vertical motion.

The dies E E^1 E^2 E^3 are nicely fitted into recesses formed in the upper part of the cylinder D, where they are held securely from all lateral motion, but may be moved vertically up and down by any pressure applied to them from below or above.

Openings are formed through the bottom of the cylinder D, directly beneath the centers of the dies; these openings are of such a form and size as will permit the passage of the heel-blanks O, and follower-blocks F, which latter are made in the shape of a heel, and of suitable sizes to fit the interior of the forming-dies.

The dies E, for forming the heels, are made as shown in Fig. 8, the matrix being of the form which is required to give the finished heel.

A head-plate, *c*, is arranged in the upper part of the matrix for forcing the pressed heel from the die. Said plate *c* is secured upon the lower end of a sleeve, *b*, which extends up through an opening in the top of the die, and upon which the discharging-punch H strikes to depress the plate *c*.

A small flange is formed around the upper end of the sleeve *b*, which, in connection with a similar flange formed around the lower part of the opening in the die, prevents the plate *c* from dropping out of the matrix.

In the center of the sleeve *b* is hung a discharging pin, *e*, which is made somewhat longer than the sleeve *b*, and is furnished with suitable flanges, which prevent it from dropping entirely out of the sleeve, or being displaced during its upward motion, while it is permitted to work freely up and down, so that it will project at either the upper or lower end, as required.

The object of the pin *e* is to release the heels from the head-plate *c*, after the latter has loosened them from the die, thereby insuring their discharge from the press.

The discharging-pin *e* is actuated by means of a spring center, *f*, in the discharging punch H.

The tops of the dies and their head-plates are pierced with small vertical openings 2, through which the awls *h* and drivers *g* descend, and into which the nails for securing the heels are inserted.

In the present instance there are only five of these openings represented in each die, but any number may be formed therein, as desired, so that all the nails required in a heel can be driven at a single operation.

The head *i* of the pintle bolt G is flanged at one side, and projects over the edge of the dies E^2 E^3, so as to prevent their being drawn up by the awls *h* or drivers *g* as they ascend.

The stamp B^1 consists of a flat plate, which is cast upon the lower end of the plunger B, and is made large enough to nearly cover all of the dies. Recesses are formed in its lower side to receive
476 the head *i* of the pintle-bolt G and pins *c*, as the stamp de-

scends, so that its under surface can come down squarely upon the top of the cylinder D.

Recesses are also formed in the stamp B^1, above the dies E^2 and E^3, into which are fitted and secured the plates 3, that hold the awls *h* and nail-drivers *g*, the former being arranged above die E^2, and the latter above die E^3, in such a manner that they will descend into the openings 2, with the motion of the stamp B^1, while above the center of the die E is arranged the discharging-punch H, which descends upon the top of the pin *c* and sleeve *b*, and above the die E^1. The bottom of the stamp is made level, so that, in descending, it will strike squarely upon the whole top surface of said die, for the purpose of pressing the heel into proper form, as will be hereafter explained.

The plunger B, which carries the stamp B^1, is supported in a vertical position by suitable ways on the front of the upright frame A^2, to which it is held by the face-plate I secured to the upright frame A^2 at each side, by screws or bolts, as shown in drawing.

The central part of the plunger B is recessed out to allow sufficient space for the eccentric J and rock-bar J^1, by means of which the spring B is operated.

The rock-bar J^1 has a bearing at its upper end upon the eccentric J, while its lower end, which is properly curved, rests upon a horizontal base, B^2, at the lowest part of the plunger B, and being closely fitted to the recess at its sides, it rocks back and forth with the action of the eccentric, thereby transmitting a very steady and powerful movement to the stamp B^1.

The bearing above the eccentric is formed by a pillow-block 3, inserted between the eccentric J and the top plate B^3 of the plunger B, as shown in Figs. 1 and 7 of the drawing.

The shaft C is operated by means of a gear, K, and pinion L, in connection with the stopping devices shown in Figs. 3 and 6.

The pinion L is fixed upon the main shaft L^1, which shaft is arranged parallel to and beneath the shaft C. It is supported in bearings M on the upright frame A^2 and table A, and it is provided with a heavy balance-wheel, N, for equalizing its motion.

The motive power is to be applied to the main shaft L^1, by means of any suitable arrangement of belts or gears, which it is not necessary to herein illustrate.

The gear K, which meshes with the pinion L, is hung loosely upon the shaft C, and has secured firmly to one of its sides a ratchet-wheel, K^1, the teeth of which incline forward in the direction of its motion, as indicated in Fig. 6.

Keyed to the end of the shaft C, outside of the ratchet-wheel K^1, there is an arm O, through the outer end of which is arranged, in a direction parallel with the axis of shaft C, a small spindle, which has secured to one of its ends a ratchet-dog, P, that engages with the ratchet-wheel K^1, and at its other end a trip-lever, P′, by means of which the ratchet-dog P is operated.

A spring, Q, is secured to one side of the arm O, which presses upon the trip-lever P′, and tends to throw the dog P into clutch with the teeth of the ratchet-wheel K^1.

The dog P is thrown out of clutch with the ratchet K^1 by the action of a stop-finger, R, upon the trip-lever P'.

One end of the stop-finger R is pivoted to the side of the arm O, as indicated in Fig. 6, while its other end is arranged to strike upon the top of the swinging stud S, which is hinged to and projects upward from the bed or table A.

The finger R is provided with a projection, *r*, that rests against the trip-lever P', and presses it upward, when the finger R strikes the stud S, thereby throwing out the dog P.

When the pressure is removed from the finger R the trip-lever P' and finger are pressed down by the spring Q.

A guard-pin *k*, is arranged beneath the finger R to prevent it from swinging too far downward.

The swing-stud S is hinged upon the bed or table A, as shown at S^1, and is swung back and forth by the bell-crank lever S^2, one end of which is rigidly secured to the side of the stud S, while its other end is connected, by means of a rod, *m*, to the rear end of a treadle, T, which latter is fulcrumed near its center to a hanging support, *l*, beneath the table A, and is provided at its front end with a foot-pad, T^1, upon which the operator places his foot when he desires to set the plunger B in motion.

A spring, T^2, is attached to the treadle-lever T, to raise its forward end when the pressure of the foot is removed.

An opening of sufficient size to allow the passage of the follower-blocks F is formed through the table A, directly beneath the die E, as indicated in dotted lines in Fig. 3, under which is arranged a feeding device, by means of which the heels are transferred to and from the dies.

This device consists of a vertical elevating spindle, U, having at its upper end a circular disk, *n*, for supporting the follower-blocks F during the operation of changing the heels.

The spindle U slides up and down in bearings *t t'*, it being raised and depressed by the hand-lever V, the rear end of which is pivoted beneath the table A, and its front end provided with a suitable handle, V'.

A slide, 4, is arranged upon the spindle U, wherein are secured the lower ends of a pair of stay-pins, 5, which pass up through the bearing *t* and disk *n* into holes 6, formed in the lower side of the follower-blocks F, and thereby retain said blocks in position upon the disk *n*.

The slide 4 is drawn upward by a spring, 7, one end of which is secured to the slide, and the other to the disk *n*.

The arrangement of the slide 4 is such that, when the spindle U is elevated to pass the heel and follower into the die, the slide 4 strikes the bearing *t*, and thereby withdraws the ends of the pins 5 from the holes 6 in the follower-block F, thereby releasing it from the disk *n*, so that it may be carried forward with the die as the cylinder D is revolved.

At the left of the elevating spindle U, and secured to one of the supporting standards A^1, is the receiving table W, and entering

slide W^1, by means of which the heel-blanks are carried to the elevating device.

A dovetailed groove, *w*, is formed across the top of the table W, in which the entering slide W^1 moves back and forth; said slide is provided with a fork, W^2, for holding the heel-blank in the proper position, and with a knob or handle, *v*, by means of which it is moved back and forth along the groove *w*.

A stud, *v'*, is set in the top of the table W, which the fork W^2 strikes, and prevents the slide W^1 from being drawn too far back.

The table W may be adjusted up or down, and it is set so that its top surface will be slightly above the top surface of the follower-block F upon the disk *n*.

A gauge-screw, *x*, is arranged through the flange *a* opposite the slide W^1, against which the heel-blanks are stopped; said screw can be moved in or out to accommodate the different sizes of heels.

A vertical groove, 8, is formed in the side of each follower-block F, to allow them to pass the end of the screw *x*.

Beneath the die E^1 is arranged a device for relieving
477 the machine from injurious concussion while pressing the heels into form. It consists of a movable metallic bed-piece, Y, somewhat larger than the bottom of the follower-blocks F, set into the table A, as indicated in Fig. 5.

A spring, Y^1, of rubber or some other suitable material, is arranged beneath, and supports the bed-piece Y, which latter is held by screws *y* in such a manner that its upper surface will not rise above the upper surface of the table A, while it can at any time be depressed by any extra amount of pressure above that required in forming the heels.

The bed-piece Y and spring Y^1 are inclosed by a cylinder, Y^2, cast upon the under side of the table, and through the bottom of said cylinder is arranged an adjusting-screw, Y^3, by means of which the spring Y^1 can be adjusted to withstand any desired amount of pressure.

A guard-plate, *z*, is inserted between the spring Y^1 and screw Y^3, as indicated.

The devices for revolving the die-cylinder D consists of a latch-dog, D^1, provided with a handle, 9, and pivoted near its center to the lower side of a curved bar, D^2, which latter is secured to the cylinder D by means of a metallic band, D^3.

The band D^3 is fitted into a groove formed around the upper part of the cylinder D, in such a manner that the curved bar D^2 and latch-dog D^1 can, by pressing upon the handle 9, be moved freely around to the right without moving the cylinder D, but by pressing the handle 9 to the left, the point of the dog D^1 catches into one of the notches 10 formed in the periphery of cylinder D, whereby said cylinder is caused to revolve, carrying forward the dies. The number of notches in the periphery of the cylinder corresponds with the number of dies, of which, in the present instance, there are four, but the machine may be constructed with a greater or lesser number of dies, if desired.

The revolving device is arranged in such a manner that it will

advance the cylinder D by one-quarter revolution at each full sweep, to the left of the handle 9.

An elastic pad or stop-lug, 11, is secured to the upright frame A^1, against which the end of the curved bar D^2 strikes when the dies are in proper position, and thereby stops any further motion of the cylinder, until the handle 9 and dog D^1 have been swung to the right, and the hold of the latter is renewed.

At the right of the cylinder D, pivoted upon a projecting portion of the table A, is a stop-dog, 12, for holding the cylinder and dies in position during the descent of the stamp B^1.

A guard-lever, Z, which acts in connection with the stop-dog 12, is fulcrumed near its center to the table A, as indicated in Figs. 2 and 3.

The forward end of lever Z works on a pin fixed in the head of the stop-dog 12, while its rear end is passed under a loop, Z^1, and furnished with a small disk, 13, as shown.

A spring, Z^2, secured to the table A, presses against the forward end of the lever Z, and tends to throw the head of the stop-dog 12 out from the notch 10 in the side of the cylinder D, and an inclined lug is fixed to the under side of the curved bar D^2, which runs under the shank of stop-dog 12, when the bar D^2 is swung hard up to the right, (see dotted lines, Fig. 3,) and thereby forces the head of dog 12 into the notch 10 to hold the cylinder in position; the same operation also swings the rear end of lever Z outward from above the spur 14 on the end of lever S^2, so that said lever can be raised by means of the treadle T.

By the use of the lever Z, in connection with the dog 12, any accident which might happen from the dies becoming misplaced, or the premature starting of the plunger, is prevented, as it is impossible to swing back the stud S and let the ratchet-dog P into gear with the wheel K^2, excepting when the head of dog 12 is in one of the notches 10, at which time the dies are of necessity in proper position. And again, if the dog 12 is but partially entered in the notch 10, when the treadle T is operated, the spur 14 will force the rear end of lever Z outward, and thereby press the head of the dog 12 properly into the notch 10.

A guard, 15, is attached to the front of the machine above the cylinder D, to prevent the die from receiving more than one heel at a time. The guard 15 is adjusted at a short distance above the cylinder, and should a second heel accidentally be placed in the die before the first is discharged therefrom, or a heel become misplaced while entering the die, the top of the die E will be raised so high that it will strike the guard 15, and prevent the revolution of the cylinder, until the cause of difficulty is removed.

The nails to be driven into the heels are fed into the machine by means of a nail-holder, such as represented in Figs. 11 and 12 of the drawing.

It consists of a head-block, 16, pierced with holes to correspond with the holes 2 in the dies. The block 16 is of sufficient thickness to support the nails in an upright position, and it is pivoted through its center to a thin bottom plate, 17, also pierced with holes in a like manner.

At one side, the bottom plate is extended outward to form the handle 18, and a spring, 19, is arranged thereon, which throws the plate 17 to one side, so that the holes in the plate 17 and head-block 16 will be out of line with each other.

Arms 20 are formed on the head-block 16, in the ends of which are formed depressions, which fit onto the studs 1 set in the top of the dies.

The nails 21 are set into the holes in the head-block 16, as shown in Fig. 11; the holder is then placed upon the top of the die E^3 in the manner shown in Fig. 12, the depressions in arm 20 fitting the studs 1, which brings the holes in the head 16 directly over the holes in the die.

The operator then swings the handle 18 to one side, to the position indicated by dotted lines, Fig. 12, which brings the holes in the bottom plate, 17, in line with the holes in the head-block, 16, thus allowing the nails, 21, to drop through into the holes, 2, of the die, so that the drivers, *g*, force them into the heels as the stamp descends.

The operation of forming the heels is as follows:

The pieces of which the heels are composed are tacked together, and secured to each other sufficiently to hold them in place. One of the blanks thus formed is placed upon the receiving table W, in front of the fork W^2, and the operator, taking hold of the handle V, runs in the slide W^1 until the heel strikes the end of the screw *x*, when he draws out the slide, leaving the heel upon the follower-block F. The elevating spindle U is then raised, by means of the lever V, and the heel-blank and follower-block F is thereby elevated to the interior of the die E, which die is, by the operation, slightly raised, so that its upper part will project from the top of the cylinder D. The operator then takes hold of the handle 9 and revolves the cylinder to the left, so as to bring the die to the position marked E^1. He then swings the handle back to the right, which forces in dog 12, to hold the cylinder in position. He then places his foot upon the foot-pad T, and presses down the treadle lever T^1, which swings back the stud S, and allows the dog P to engage the ratchet-wheel K, which operates the eccentric and moves down the plunger B, bringing the stamp B^1 down upon the die E^1, and forcing it down upon the follower-block F, thereby compressing the heel-blank H^1 firmly into the matrix against the head-plate *c*.

When the shaft C has made its revolution the stop-finger R strikes upon the end of the stud S and raises the trip-lever P′, thereby swinging back the dog P, and stopping further motion of the shaft C and plunger B. 478–480

The cylinder is then revolved again, which brings the die to the position marked E^2, when the plunger B, being again started, the awls *h* are forced down through the openings 2 and perforate the heel.

After the heel has been perforated the cylinder is revolved to bring the die to the position marked E^3, when the operator places the nail-holder containing the nails over the die, and drops the nails into the openings, in the manner before explained. After removing the nail-holder the plunger B is again started, and the drivers *g*

descend into the openings 2 and force the nails into the perforations formed by the awls *h*.

The cylinder is again revolved, which carries the die to the position from whence it started, and, as the plunger descends, the discharging punch presses down the head-plate *c* and discharging-pin *e*, thereby forcing the completed heel from the die, which, together with the follower-block F, drops down upon the disk *n*, and is removed from thence by the hand of the operator, the operation being completed.

It will be understood that after the dies are filled, a finished heel is removed and a fresh blank is inserted as each die passes the position marked E, so that, although it requires four operations to complete the heels, by using four dies, all of said operations are accomplished at each stroke of the plunger B and stamp B^1, thereby forming the heels very rapidly.

It will be observed that the perforations are formed and the nails driven while the heels are under pressure from all sides, whereby the leather of the different layers of which the heels are composed, is kept from unduly expanding after the pressure has been removed, and also that the uneven edges of the lifting are pressed inward, thereby forcing all of the stock into the heel, so that there is no waste from trimming, the edges being left firm and smooth, and of the proper form, whereby they only require to be finished up, while the heels, being firmer and more solid, will wear much longer than heels made in the ordinary way.

Different sizes of dies and follower-blocks are made for the different sizes and forms of heels, and heels of different thicknesses may be made by varying the thickness of the follower-blocks F or head-plates *c*, while, by changing the length of the driver *g*, the nails may be driven into the heels to a greater or lesser extent.

In lieu of supporting the forming-dies in a revolving cylinder, they may be arranged in a sliding-support, and move back and forth under the stamp B^1, or a single die may be used separately, but I prefer to use them in the manner shown.

It will be understood that, by my improved press, all of the nails may be partially driven, to be subsequently driven the remaining portion of their length by another machine, which secures them to the boots or shoes, or, if preferred, only a few of the nails may be driven, all of the holes being formed to receive the nails as the heels are used.

Having described my improved heel-press,

What I claim therein as new and of my invention, and desire to secure by letters patent, is—

1. The combination of the follower F with the die E, substantially as and for the purposes set forth.

2. The combination with the forming-die of the head-plate *c*, substantially as and for the purposes set forth.

3. The combination, with the head-plate *c* and sleeve *b*, of the discharging-pin *e*, substantially as and for the purposes set forth.

4. The combination, with the sleeve *b* and discharging-pin *e*, of the discharging-punch H, provided with a spring center *f*, substantially as and for the purposes set forth.

5. The combination, with discharging-pin *e*, of the spring center *f*, substantially as and for the purposes set forth.

6. The combination, in a machine for forming pressed heels for boots and shoes, of the following elements, viz: a die for pressing the heel into proper form, provided with holes for the passage of the heel-perforating awls, nails, and nail-drivers, a series of perforating awls, and a series of nail-drivers, substantially as and for the purposes set forth.

7. The combination, with die E, and follower-block F, of the elevating disk *n*, substantially as and for the purposes set forth.

8. The combination, with the disk *n* and bearing *t*, of the slide 4, and pins 5, substantially as and for the purposes set forth.

9. The combination, with the disk *n*, and receiving-table W, of the slide W^1, and fork W^2, substantially as and for the purposes set forth.

10. The combination, with the disk *n* and follower-block F, of the screw *x* and fork W^2, substantially as and for the purposes set forth.

11. The combination, with the fork W^2, of the stop-pin or stud *r'*, substantially as shown and described.

12. The combination, with the bed or table A, and cylinder D, of a forming-die E, and follower-block F, substantially as and for the purposes herein set forth.

13. The flanged head *i* on the pintle-bolt G, substantially as and for the purposes set forth.

14. The combination, with the cylinder D, of the stop-dog 12 and the mechanism for rotating the cylinder, substantially as shown and for the purposes set forth.

15. The combination, with the table A and cylindrical receptacle Y^2, of the bed-piece Y, spring Y^1, plate Z, and adjusting-screw Y^3, substantially as and for the purposes set forth.

16. The combination of the stop-dog 12, the bell-crank lever S^2, the guard-lever Z, and the spur 14, substantially as described.

17. The combination, with the ratchet-wheel K^1, arm O, and swinging-stud S, of the dog P, trip-lever P', spring Q, finger R, and guard-pin *k*, substantially as and for the purposes set forth.

18. The nail-holding device, composed of the parts 16, 17, 18, 19, and 20, substantially as shown and described.

19. The combination of the arms 20 of the nail-holder, with the studs 1 on the forming-dies, substantially as shown and for the purposes stated.

20. A machine for forming compressed heels for boots and shoes, the mechanism of which is constructed and arranged substantially as described, so that the heel is compressed on all sides, and held under continued pressure during the operation of perforating the heel and driving the nails, for the purposes set forth.

HORACE H. BIGELOW.

Witnesses:

THOS. H. DODGE.

S. EMERSON HARTHAN.

483 UNITED STATES PATENT OFFICE.

MORRIS WELLS, of Williamsburg, New York.

Letters Patent No. 64176, dated April 23, 1867.

Improvement in Machine for Shaping Metals.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern :

Be it known that I, Morris Wells, of Williamsburg, in the county of Kings, and State of New York, have invented a new and improved machine for shaping sheet metal; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

(Here follows diagram marked p. 482.)

Figure 1 represents a front elevation of this invention.
Figure 2 is a longitudinal vertical section of the same.
Similar letters of reference indicate like parts.

This invention relates to a machine for shaping sheet metal, in which the die, together with the bed supporting the same, is raised against the clamp and plunger, the clamp being secured to a cross-plate which bears against adjustable springs, whereby it is rendered yielding, and the plunger being secured to a cross-head to which a rising and falling motion is imparted by a crank in the same shaft, which also carries the cams or eccentrics which serve to impart the required motion to the die and bed supporting the same. The clamp being secured to a yielding plate is capable of accommodating itself to blanks of unequal thickness.

A represents a frame made of cast iron or any other suitable material of sufficient strength for the occasion. The upper part of this frame forms the bearings for the shaft B, which serves to impart motion to the various working parts of my machine. In said shaft are mounted two cams or eccentrics C, which act on straps D, and from the ends of these straps extend the rods *a*, from which the platform E is suspended. On this platform is secured the die F, and suitable strips, *b*, which are secured to the side-pieces of the frame A, serve as guides for the platform, to keep the same in its proper course, while it is moved up and down by the action of the cams C on the straps D. As the platform E rises the die F is pressed up against the clamp G, which consists of a ring, the lower end of which fits into a circular recess in the top of the die and bears upon the blank placed into said recess, as shown in Fig. 2 of the drawing, where the blank is indicated in red outlines, and said clamp is

481 Wells Patent, No. 64,176. See Vol. I, page 72.

M. Wells,

Sheet-Metal Die.

No. 64,176. Patented Apr. 23, 1867.

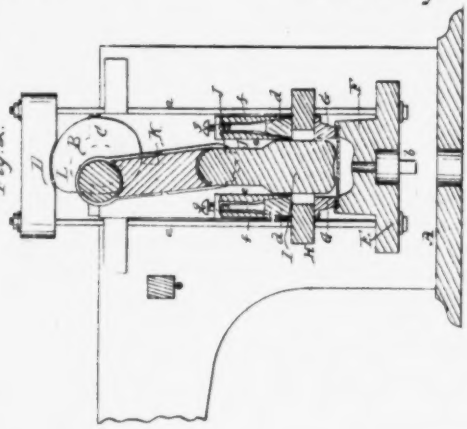


Fig. 2.

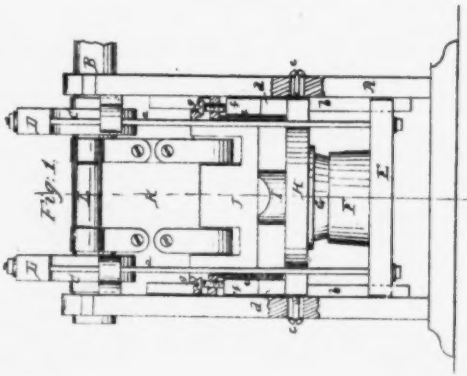


Fig. 1.

No. 139. Mortised Bed. Patented Apr. 9, 1867.

Witnesses.

A. F. Hagelgen
Peter Smith

Inventor.

Myron Wells
Per Munn & Co
Attorneys

secured to a cross-bar, H, which is secured to the side-pieces of the frame H by screws, *c*, passing through slots, so that said cross-bar is free to rise and fall within certain limits. Springs *d* bear on the upper surface of the cross-bar and render the same yielding, so that the clamp can adjust itself to blanks, being thicker on one side than on the other, or to blanks of different thickness. Said springs are made of India rubber, or other suitable material, and they are enclosed in tubes or cases, *e*, which are provided with plungers, *f*, and regulating screws, *g*, so that the tension of the springs, or the pressure exerted by the same on the cross bar H, can be regulated at pleasure. Through said cross-bar and through the clamp passes the punch I, which serves to depress the blank into the die and to bring the same in the desired shape. This punch is secured to a cross-head, J, which moves up and down on the guide-strips *b*, and which connects by a link, K, with the crank L in the shaft B, so that by turning said shaft the desired rising and falling motion is imparted to the cross-head and punch. The link K is fitted in between and connected to the crank and cross-head, so that it is always in contact with both, and a positive and powerful motion is imparted to the cross-head and to the punch in either direction. The crank L is placed in such relation to the cams C that the blank placed in the recess of the die is firmly held between the clamp and die before the punch takes effect, and also during the time when the punch acts, and thereby the rim of the blank is prevented from wrinkling, and smooth and sound articles can be produced.

By this machine the operation of shaping articles of sheet metal of various kind is rendered comparatively easy, and by supplying a number of dies, clamps, and punches, which can be introduced in one and the same machine, a large variety of sheet-metal vessels or articles can be produced with little trouble or expense.

What I claim as new, and desire to secure by letters patent, is—

1. The combination of springs *d* with the cross-bar supporting the clamp G, substantially as and for the purpose described.

2. The link K fitted closely between the cross-head J and crank L, and operating in combination with the die F and punch I, substantially as and for the purpose set forth.

MORRIS WELLS.

Witnesses:
HENRY B. GERST
FRED. PEUSER.
GEO. L. FOX.

487 UNITED STATES PATENT OFFICE.

CHARLES F. WILSON, of Northbridge, Massachusetts, and SAM. H. MILLER, of Brooklyn, New York, assignors to themselves and Jesse E. Folk, of Brooklyn, New York.

Improvement in Dies for Cutting and Cupping Sheet Metal.

Specification forming part of Letters Patent No. 138,721, dated May 6, 1873; application filed December 24, 1872.

To all whom it may concern:

Be it known that we, Charles F. Wilson, of Northbridge, in the county of Worcester and State of Massachusetts, and Sam. H. Miller, of the city of Brooklyn, in the county of Kings and State of New York, have invented an improvement in dies for cutting and cupping or drawing metals and other materials, of which the following is a specification.

This invention relates to the manufacture of various cupped articles by cutting or stamping out a blank from metal, pasteboard, or other material in the sheet, and afterward giving it a cup-shape by indenting and drawing out said blank. The invention consists in certain arrangements of dies, clamping-ring or follower, and spring for operating the latter, whereby a stout or deeply-cupped article may be very effectually produced without puckering, not only by the same dies used to cut out the blank, and at the same operation, but so that a single die action or motion, such as obtainable from a single reciprocating plunger of an ordinary power or other suitable press, will answer to complete the work.

Having thus specified the object or objects and nature of the invention, its description will be proceeded with in reference to the accompanying drawings.

(Here follows diagram marked p. 486.)

Figure 1 represents a longitudinal section of a pair of dies with a spring-borne clamping-ring or follower combined, all constructed in accordance with the invention, and shown as having cut a blank from the sheet, and as commencing to cup the same. Fig. 2 is a similar view to Fig. 1, but showing the parts as about completing the cupping operation. Fig. 3 is a face view of the blank as cut or stamped from the sheet, and Fig. 4 a partly broken side view of the cupped article as produced by the dies.

A is a combined male cutting and female cupping die, and B a female cutting-die, and *d* a male cupping one, the two latter, which may be connected or combined so as to form one structure, having a clamping-ring or follower, C, between them. These several dies are represented as having a vertical position, with the die A uppermost, but the position of the dies A B *d* may be changed or reversed at pleasure, and either the die A or the combined dies B *d* be made

485 Wilson & Miller Patent, No. 138,721. See Vol. I, page 72.

C. F. WILSON & S. H. MILLER.

Dies for Cutting and Cupping Sheet Metal.

No. 138,721. Patented May 6, 1873.

Fig. 1

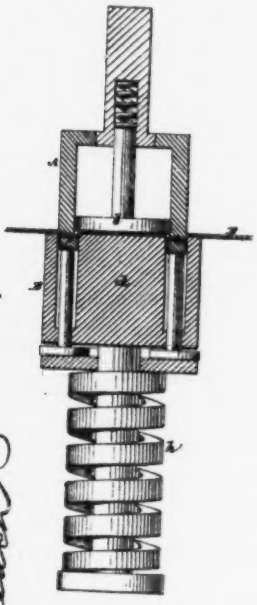


Fig. 2

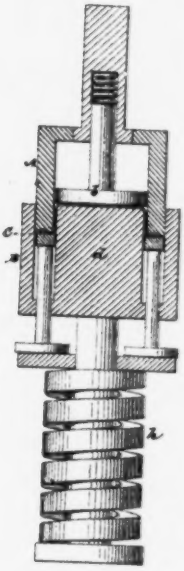


Fig. 4

Fig. 3

Witnesses:
Fred Haynes
Fred Dueed

Chas F. Wilson
Sam'l H. Miller
by Brown & Allen
Attorneys

to move, or both the die A and dies B *d* have motion given them. It will suffice here, however, to refer to the upper die A as being the operating one and the dies B *d* as stationary; also, to refer to the sheet being operated on as being metal.

The devices for holding and actuating the dies are not here shown, inasmuch as the same may be varied, but a screw or power press will answer every purpose.

D, in Fig. 1, is the metal sheet being operated on, the same being slid or placed over the lower dies B *d* while the upper die A is raised. The combined male cutting and female cupping die A is of hollow cylindrical construction, its outer lower margin forming its male cutting edge or portion, and its interior, which is fitted with a spring-borne plunger, *b*, that bears down on the center portion of the blank, being the female cupping-part of the die. The combined female cutting-die B and male cupping-die *d* leave an annular space, the outer upper margin of which is the cutting-edge of the female cutting-die B, and in close contact with which the outer cutting-edge of the male cutting and cupping die A works as the latter passes down within the annular cavity of the lower die. The male cupping-die *d* receives the female cupping portion of the die A loosely over it to give room for the cupping of the blank. The clamping-ring or follower C is arranged to freely fit the annular space separating the dies B and *d*, and is borne upward or outward toward the upper die A by a stout spring, *h*, and suitable connections.

At the commencement of the down-stroke of the upper die A the blank is first cut or stamped out from the sheet D, and subsequently, by a continuation of the down-stroke of the upper die, is drawn out and cupped, as required, without puckering of its margin by the action of the several dies relatively with each other and clamp or hold of the marginal portion of the blank during the act of cupping, between the ring C and lower end of the upper die, the mar-
488 ginal portion of the blank thus held being gradually drawn out from between said ring and the upper die against an increasing resistance of the spring *h*, and is formed or worked up into the sides of the cupped article free from all irregularity and blemish of finish. After the cupped article has been thus produced it is expelled from the lower die by the clamping-ring C upon the working die A being moved upward to admit of it.

By the combination and arrangements of parts, as shown and described, it will be observed that not only may deeply-cupped articles be produced without puckering by the same dies used to cut out the blank, and at the same operation, but that a single die action or motion, such as is obtainable from a single reciprocating plunger of an ordinary power-press, is sufficient to complete the work, thus dispensing with a second or auxiliary plunger action that involves complicated mechanism. By the spring *h*, too, being arranged on the outside of or beyond the dies, as represented in the drawing, for action, by plungers and rods or any suitable intermediate devices on the clamping-ring or follower C, we are enabled to use a much stouter spring than could possibly be used if arranged within the dies or space separating the dies B and *d*, and are consequently

able to produce, by means of the dies, deeper-cupped articles and o stouter material—or, in other words, articles totally different as re gards their uses—than if the spring were arranged within the dies

What is here claimed is—

1. The combination, substantially as herein shown and described with the female cutting-die B, male cupping-die *d*, and the female cupping-die A, constructed to also form a male cutter, of the spring-borne clamping-ring or follower C, wholly within the space separating the dies B and *d*, for operation together, as specified.

2. The arrangement of spring *h* externally to the dies, and the device supported by said spring, and which supports the follower C, within the die, substantially as described and shown, whether said device be posts or any equivalent thereof.

CHARLES F. WILSON.
SAM. H. MILLER.

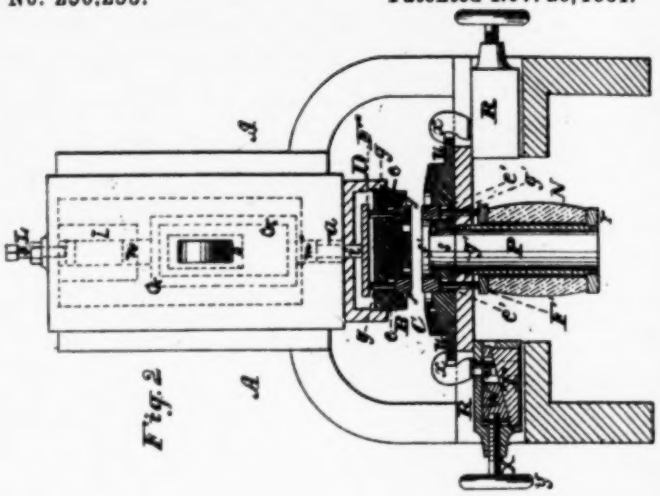
Witnesses:
MICHAEL RYAN.
FRED. HAYNES.

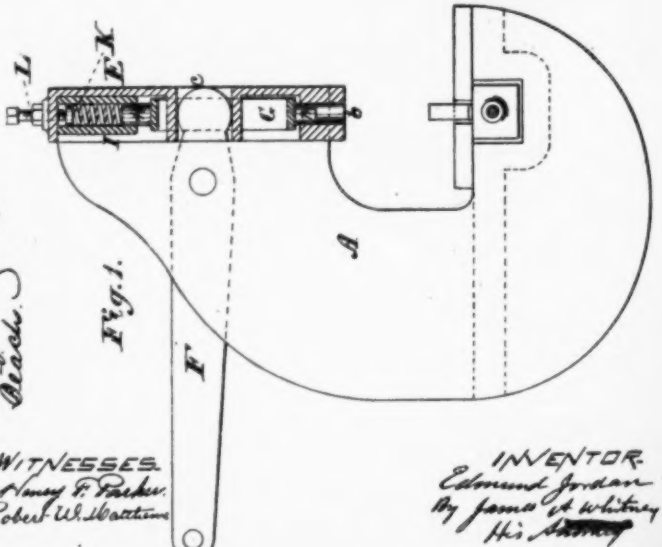
(No Model.)

E. JORDAN.

PRESS FOR WORKING SHEET METAL.

No. 250,255. Patented Nov. 29, 1881.





No. 39. Patented Oct. 4, 1881. Reissued

WITNESSES.
Nancy F. Parker.
Robert W. Watkins

INVENTOR.
Edmund Jordan
By James A. Whitney
His Attorney

491 UNITED STATES PATENT OFFICE.

EDMUND JORDAN, of Brooklyn, assignor, by direct and mesne assignments, to Eliphalet W. Bliss, of New York, N. Y.

Press for Working Sheet Metal.

Specification forming part of Letters Patent No. 250,255, dated November 29, 1881. Application filed December 31, 1880. (No model.)

To all whom it may concern:

Be it known that I, Edmund Jordan, of Brooklyn, in the county of Kings and State of New York, have invented certain improvements in presses for working sheet metal, of which the following is a specification:

This invention relates to that class of presses designed for pressing or stamping sheet metal; and its object is to provide for the disengagement of the stamped article from the dies in a more positive and effective manner than is attainable with the ordinary appliances used for that purpose, and also less liable to derangement of the apparatus itself.

The invention comprises certain novel combinations of parts, whereby the aforesaid object is effectually secured.

(Here follows diagram marked p. 490.)

Figure 1 is a side elevation and partial longitudinal sectional view of an apparatus embracing my said invention, and Fig. 2 is a front elevation and partial vertical transverse sectional view of the same.

A is the frame of the apparatus, which, being substantially of the ordinary construction, needs no special description here.

B and C are the upper and lower dies, which have, of course, a configuration and construction suitable to the particular variety of work for which they may be designed. The upper die, B, is provided with the circumferential screw-thread, as represented in Fig. 2, by which it is screwed into a shell, D, the said shell being, of course, provided with an internal screw-thread for the purpose. Extending upward from the center or axis of this shell D is a tubular sleeve, (indicated at dotted outline at *a* in Fig. 2,) which fits into a socket, (shown at *b* in Fig. 1,) this socket being provided in the lower end of the vertically-moving head E of the apparatus, this head being placed in guides provided to the frame A in the usual way, and therefore requiring no specific description, and the said head receiving its vertical movement through a lever, F, the short arm of which works in a socket, *c*, as represented in Fig. 1. The die B has formed in its under side an annular groove, *e*, (represented in Fig. 1,) into which is fitted an annulus, *f*, which, when forced upward into the groove *e*, forms practically part of the die, the

lower surface of the said annulus being coincident with the adjacent end surface of the other portions of the die.

F″ is a plate, from which extend downward short rods *g*, the short rods passing through suitable holes in the upper part of the die B, and having their lower ends attached to the top of the annulus *f*. Extending upward from the center of the plate F is a stem, *i*, which passes through the sleeves *a* of the shell D, with its upper end bearing against a stud, *m*, which projects downward from a slide, G, the space between the die B and the top of the shell D being sufficient to permit a vertical movement of the said plate, and consequently of the short rods *g* and the annulus *f*. The slide G is yoke-shaped, as indicated in section in Fig. 1 and in dotted outline in Fig. 2, in order that it may be placed astride and outside of the socket *c* of the head E, and yet within the said head.

It is to be observed that the stud *m* fits into the upper part of the bore, the lower part of which constitutes the socket *b*, for the reception of the sleeve *a*. A similar stud, *n*, extends upward from the top of the slide G into a cylindrical chamber I, in the upper part of the head E. The lower part of the chamber I serves as a guide for the stud *n*, while its main postion constitutes a receptacle for a spiral spring, K, which presses downward upon the stud *n*, and consequently upon the slide G. This spring may be compressed to any desired extent by means of a screw, L, which works through a suitable nut in the top of the head E, and bears against a washer placed upon the upper end of the spring K. The die B, being screwed into the shell D, as hereinbefore explained, has a much more solid attachment to its actuating mechanism than is obtained by the usual devices for that purpose. In the operation of the press the downward movement of the die B in shaping the metal to the required form forces upward the annulus *f*, with reference to the said die, during the operation of compressing or shaping the metal; but when the die B moves upward, the yoke G is forced downward by the spring K, and thereby throws downward the annulus *f* and detaches the stamped metal or completed article from the die, and thereby discharges the same from the latter.

492 It is, of course, to be understood that the annulus *f* is so attached to the lower extremities of the short rods *g* as to follow the movement up or down of the said studs with reference to the die B.

The die C has formed in its upper side an annular groove *e′*, in which is placed an annulus *f′*, which is connected by rods *g′* with the annular plate F′, which is forced upward by a spring, N, which may be of india-rubber, and which may be placed around the tube P, as represented in Fig. 2.

A nut, *r*, may be screwed upon the lower end of the said tube P, to afford a support for the bottom of the spring N.

It may be remarked that the tube P is a continuation of the central opening, *s*, of the lower die, through which a portion cut from the sheet-metal blank is allowed to fall during the stamping or pressing operation by which the blank is brought into the shape desired. During the stamping operation the ring *f′* is depressed

flush with the other portions of the die C in substantially the same manner that the annulus *f* is brought flush with the other portions of the die B; but when the die B is lifted, thereby releasing the sheet metal, the latter, in case it adheres to the die C, is forced out therefrom and discharged by the upward movement of the annulus *f'*, acted upon by the spring N.

The die C is attached in place as follows: The said die is provided with the circumferential flange, or, as the equivalent thereof, with flat radially-projecting lugs *u*, which rest upon the adjacent portions of the frame A, as more clearly represented in Fig. 2. Provided in the horizontal portion of the frame A are fixed boxes R, one of which, with its contents, is shown in section at the left-hand side of Fig. 2. In each of these boxes is placed a block, T, the upper surface of which forms an inclined plane, as represented in the said Fig. 2, and which has extending up from it through a suitable opening in the top of the box a stem, *w*, upon the upper end of which is a hook, *x*. Placed above each block T is another block, W, the under side of which is inclined opposite to the contiguous surface of the block T, so that when the block W is moved inward the block T will be forced downward within the box. The block W, it must be mentioned, has in it a vertical elongated slot, which permits the passage through it of the stem *w*. The block W is moved in or out, as occasion requires, by means of a screw, X, which works in a suitable nut formed in the outer end of the box, the said screw being provided at its outer extremity with a suitable means of turning—as, for example, a hand-wheel *y*. The hook *x* being placed over the lugs *u*, and the screws X being turned to force the blocks W inward, the blocks T are crowded downward, and thereby cause the hooks *x* to firmly gripe the lugs *u* against the supporting portions underneath the frame A. The die C is by this means firmly attached in place, and yet capable, on occasion, of being very readily detached or replaced, as circumstances may require.

What I claim as my invention is—

1. The combination of the upper die, having the annular groove *e*, the annulus *f*, and the plate F'', connected by the rod *g*, the slide G, spring K, and sliding head E, the said parts being constructed and arranged for joint use and operation substantially as and for the purpose herein set forth.

2. The combination of the lower die, having the annular groove *e'*, the annulus *f'*, and plate F', connected by the rods *g'*, the spring N, and the nut *r*, supported by the tube P, the whole constructed and arranged for joint use and operation substantially as and for the purpose herein set forth.

3. The combination of the boxes R, the blocks T and W, having inclined and coincident faces, the hooks *x*, attached to the blocks T, and the die C, the whole constructed and arranged for joint use and operation substantially as and for the purpose herein set forth.

EDMUND JORDAN.

Witnesses:

CHAS. H. DOXAT.

ROBERT W. MATTHEWS.

497 UNITED STATES PATENT OFFICE.

WILLIAM ST. HILAIRE, of Lynn, Massachusetts, assignor of one-half to Almer B. Jernigan, of same place.

Machine for Shaping Heel-stiffeners.

Specification forming part of Letters Patent No. 240,561, dated April 26, 1881. Application filed March 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, William St. Hilaire, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful improvements in machines for shaping heel-stiffeners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to machines for shaping heel-stiffeners; and it consists in the construction and combination of parts hereinafter set forth and claimed.

(Here follow diagrams marked pp. 494 & 496.)

In the accompanying drawings, figure 1 represents a perspective view of a machine embodying my invention. Fig. 2 represents a bottom view of the same, omitting the lower portions. Fig. 3 represents a longitudinal vertical section through the middle of the same, and Figs. 4 and 5 represent detail views.

A designates the frame of my machine, which is provided with a table, A′, and at one end a vertically-slotted guide-standard, A^2, reaching from the base of the frame to said table. In this guide-frame and through said table works a vertical plunger, B, which is beveled at both ends. Its lower end, *b*, receives upward motion from a cam, C, carried by the driving-shaft, and its upper end, *b′*, bears against the similarly-beveled outer end of the shank *d* of a former, D, thus giving horizontal forward motion to said shank in suitable guides and moving the body of the former over the central opening of the table. When said former strikes against and forces backward the middle part of the matrix E, consisting of curved jaws *e e*, hinged together at *s* and having reversely-curved tails *e′ e′*, these tails impinge upon the sides of a triangular intermediate guide-block, F, which causes the front part of said matrix to close around said former. A guide-plate, G, secured to or formed with the top of said guide-block, and extending beyond its sides and point, prevents the said jaws from being displaced in an upward direction. As the said cam passes from under the said plunger this plunger is retracted by spring *h*, the former D by spring *h′*, and the matrix by spring h^2.

16629

(No Model.) 2 Sheets—Sheet 1.

W. ST. HILAIRE.

Machine for Shaping Heel Stiffeners.

No. 240,561. Patented April 26, 1881.

Fig. 1.

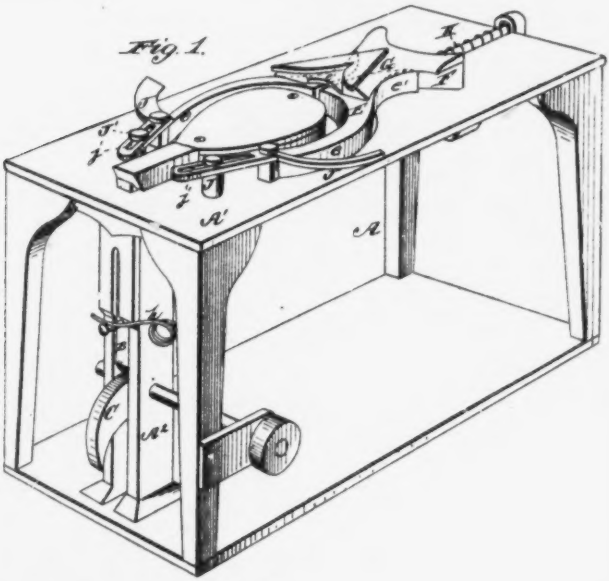
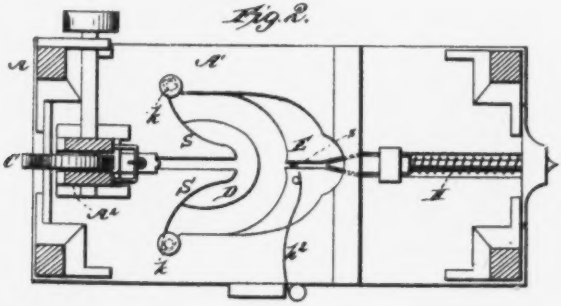


Fig. 2.



Witnesses.
Robert Everett
Edward Siggers

Inventor.
William St Hilaire
by W. H. Babcock
Atty.

16630

(No Model.) 2 Sheets—Sheet 2.

W. ST. HILAIRE.

Machine for Shaping Heel Stiffeners.

No. 240,561. Patented April 26, 1881.

Fig 3.

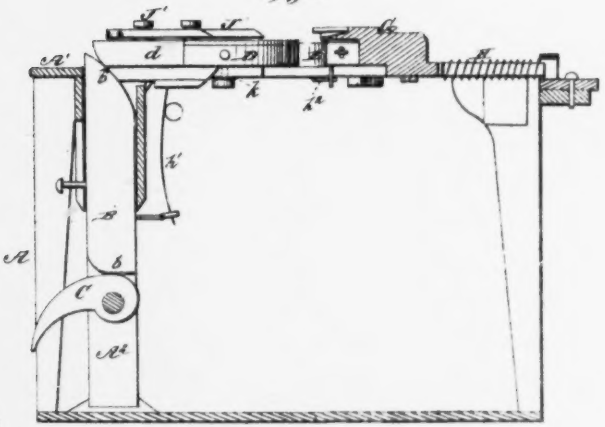


Fig 4.

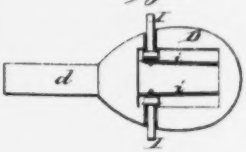
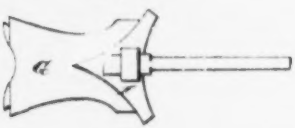


Fig 5.



Witnesses.
Robt Everett
Edward Siggers

Inventor.
William St Hilaire
by H. B. Wilcox
Atty.

The guide-block F is held to its place by a strong spring, H, which is preferably wound round a shank or rod attached to said block and set within a slot of table A′. This spring keeps the block motionless under all ordinary pressure, but will yield sufficiently to prevent refractory material from being injured when its thickness causes extraordinary strain.

The former D is provided with two spring-pressed yielding pins, I, which protrude through its sides and on which the blank is supported as the said former moves forward. The matrix, in closing on said former, forces in said pins, which are thrown out again by springs *i i* when the former withdraws from the matrix.

The forward ends of the matrix-jaws *e e* have pivotal connection with two crimping-jaws, J J, which are sickle-shaped and provided in their straight portions with guide-slots *j j*, that enable them to slide longitudinally over fixed guide-studs J′ J′. The closing of said matrix causes the curved and sharp-edged parts of said crimping-jaws to close upon the portions of the counter protruding above the top of the former and to fold them over the same tightly, thereby crimping them. These crimping-jaws do not reach the remotest part of the counter, which is next to the forward end of the former. Hence the guide-plate G is extended sufficiently far beyond the point of the guide-block F and toward the former D to complete the crimping of the counter-stiffener.

The operating ends of the matrix-jaws *e e* are provided with downwardly-extending studs *k k*, which move in the curved guideways S S of the table A′. The shape of said guideways is such as to draw the said studs, and consequently the outer ends of the matrix-jaws, inward, so as to give a wiping motion in addition to the side pressure of the jaws. As said jaws are attached to each other solely by the hinge *s*, they are free to accommodate themselves to the motion given by said studs and guideways. The lower ends of said studs are provided with buttons, which hold them from rising out of position.

498 The blank for the counter is first placed on protruding pins I I and around former D, which then moves forward, causing the matrix to close, and thereby shaping the sides of the counter. The crimping-jaws then close and crimp that part of the counter which is to be horizontal. The workman moves forward the next blank, and thus pushes the finished counter off the former D. It then falls through an opening in table A′.

Having thus fully described my invention, what I claim as new, and desire to secure by letters patent, is—

1. The combination of a former with spring-pressed pins protruding from its sides and a matrix arranged to force said pins inward.

2. The combination of a former with a matrix, guide-block, and spring bearing against the latter, said spring being adapted to yield only under excessive pressure, for the purpose set forth.

3. A pair of reversely-curved jaws forming a matrix, in combination with a triangular guide-block between the curved tails thereof,

and a former arranged to be pressed against the said matrix in fr
of said guide-block, substantially as stated.

4. A pair of slotted crimping-jaws, in combination with fi
studs, a matrix to which said crimping-jaws are connected, an
former, operating substantially as set forth.

5. A guide-plate forming a rear crimping device, in combinati
with crimping-jaws, a matrix, and a former, constructed and op
ating substantially as set forth.

6. In a machine for making boot and shoe counters, the form
D and its shank *d*, in combination with the plunger B, gui
standard A^2, and cam C, all substantially as set forth.

In testimony whereof I affix my signature in presence of two w
nesses.

WILLIAM ST. HILAIRE

Witnesses:
H. E. LODGE.
F. G. SIMPSON.

16632

(No Model.)

J. L. HATCH.

COUNTER STIFFENER MACHINE.

No. 286,432. Patented Oct. 9, 1883.

Fig:1.

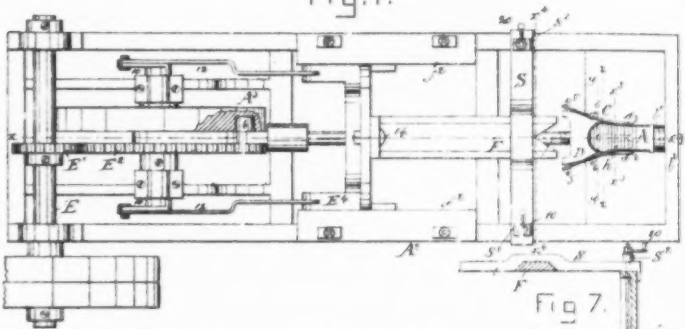


Fig 7.

Fig:2.

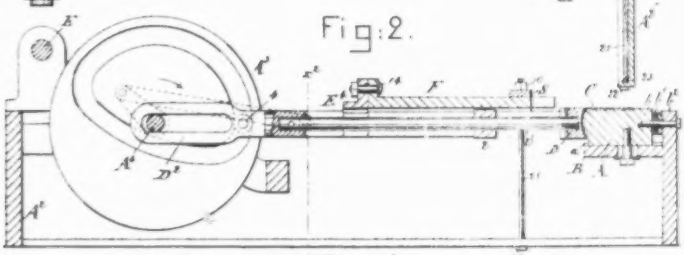


Fig:4

Fig:3.

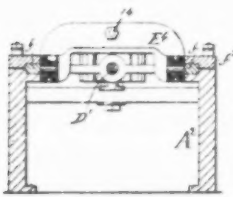


Fig:5.

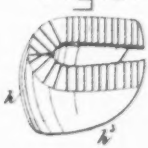
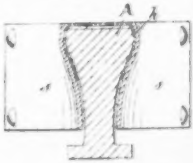


Fig:6.



Witnesses.

W. J. Noyes

John E. C. Rockhart

Inventor.

James L. Hatch.

by Crosby & Gregory attys

501 UNITED STATES PATENT OFFICE.

JAMES L. HATCH, of Rochester, New York.

Counter-stiffener Machine.

Specification forming part of Letters Patent No. 286,432, dated October 9, 1883. Application filed August 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. HATCH, of Rochester, county of Monroe, and State of New York, have invented an improvement in machines for elongating and finishing counter stiffeners for boots and shoes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In the manufacture of counter-stiffeners the leather or leather-board, cut into the proper shape, is rolled or flanged between a revolving and a stationary mold, which leaves the counter-stiffener in a too nearly circular form to fit the heel of a last, and thereafter the said rolled counter-stiffener is molded between firm, rigid, hinged jaws of a divided mold, the latter clamping the stiffener to the form, while a V-shaped slide irons and sets the flange. In my experiments to produce a counter-stiffener to fit the human heel, I have discovered that the said stiffener may be greatly improved in shape by stretching the same at its sides on the same machine which irons and sets the flange. To this end I have combined with the heel-like form on which the rolled stiffener is placed and held an impinging follower and a connected clamp composed of one or more springs, which act upon the outer sides of the rolled stiffener placed on the said form and stretch and elongate it from its median line along its sides, and in connection with the same I use a horizontally-reciprocating V-shaped slide by which to iron and smooth down and set the flange partially set in the rolling process.

(Here follows diagram marked p. 500.)

Figure 1 in top view, represents a machine containing my improved apparatus for elongating and finishing counter-stiffeners, the stiffener being shown in dotted lines. Fig. 2 is a longitudinal section of Fig. 1 on the dotted line $x\,x$, the guide for the V-shaped slide being, however, omitted; Fig. 3, a cross-section on the dotted line $x^2\,x^2$, Fig. 2. Fig. 4 represents a stiffener as taken from the rolling-machine to be stretched and finally shaped by the machine herein described. Fig. 5 represents a finished stiffener; Fig. 6, a section of Fig. 1 on line $x^3\,x^3$, and Fig. 7 a section of Fig. 1 on line x^4.

The heel-form A, composed of cast metal and of suitable size, according to the stiffener to be elongated and finished, rests in a groove, *a*, in the bed-plate B, and slides therein more or less, as the

stiffener is acted upon by the stretching-clamp C. The heel-form has a bolt or rod, *b*, which is entered through a rigid upright part, b^2, of the usual frame-work, A^2, and through a suitable spring, *b'*, preferably of india-rubber.

The follower D, forming part of the stretching-clamp, is made as a solid block, concaved at its front end and wider at top than at bottom (see Fig. 6), thus giving to it vertically-inclined faces, is attached to a suitable rod, D', which, in practice, will be guided in a suitable bearing, 2, one or more, and will be reciprocated longitudinally by means of a suitable cam, A^3, the face of which receives a pin or roller, 4, attached to the slotted part D^2 of the rod D', the shaft A^4, to which the said cam is attached, being extended through the slot in D^2. This follower has attached to it the steel springs *s s* of the clamp, each spring being connected with the follower D by suitable bolts, 5 6, and preferably connected therewith in an adjustable manner by making the central part of the side faces of the follower D, between the bolts 5 6, higher than at the said bolts (see Fig. 1), so that adjustment of the bolts 5 6 will enable the free or front ends of the springs *s s* of the clamp to be more or less separated; and so, also, to stiffen the said springs, the bolts may be moved to more or less bend the springs over their fulcra. It will also be understood that I may stiffen the springs, if desired, by adding a leaf of spring outside each spring *s*, as wagon-springs are commonly stiffened, the outer end of that stiffening-leaf not, however, being extended but little beyond the bolt 6.

The main shaft E of the machine, having suitable bearings in standards mounted on the frame-work, has a pinion, E', which engages a tooth-gear, E^2, fast on the cam-shaft A^4 at the side of the cam A^3, before described. The shaft A^4 has fast at each end of it a crank, 10, which, by link 12, is jointed to a carriage, E^4. The links 12 are connected with this carriage at each side of its center, and the carriage provided with suitable projections, *f*, which are fitted under cap-plates f^2, which thus act as a guideway for the carriage as it is reciprocated by the said cranks and links.

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The carriage E^4 has attached to it by bolt 14 the V-shaped slide F, which is moved forward horizontally above the heel form and clamp to iron down, smooth, and set the flange of the counter. The forward part of the V-shaped slide is guided in a guide-plate, S, provided at its under side with a dovetail or other suitable groove to receive the said slide.

The plate S is held down by springs S^2, acted upon by suitable nuts, 20, on bolts 21, by which to adjust the strength of the said springs, and thereby permit the slide F to rise more or less, according to the thickness of the turned-over or flanged part of the stiffener.

The rolled stiffener *h* (see Fig. 4) having been placed upon the heel-form A, the clamp will be moved forward, and the curved end of the springs will first impinge against the stiffener at about the line *y y*, and will then spread as the clamp is being moved forward, and will slide over and in contact with the said stiffener on

the heel-form until the springs reach the thickest part of the heel-form, which is in the line *z z*, at which time the stiffener is subjected to the greatest elongation or stretching strain from its back vertical center or median line. After this the free ends of the springs are gradually permitted to approach each other, following in and hugging closely to the outer side of the stiffener supported upon a thinner part of the heel-form, stretching, smoothing, and elongating the said stiffener from the said line *z z* forward to its ends.

If desired, I may relieve the pressure of the springs on the stiffener as the clamp is drawn off backward. To do this the lower edge of each spring will be provided with an incline to strike against a roller or stud, which will be thrown up in the path of the backwardly-moving clamp. The clamp having been moved fully forward, as in Fig. 1, and the springs *s s* having acted upon the sides of the stiffener and stretched and fitted it to the contour of the heel-form, the slide F will be moved forward until its V-shaped end passes beyond the corners of the flanged part of the stiffener, the said slide, by its downward and forward pressure, which may be varied in amount as desired, ironing, smoothing, and setting the flange of the stiffener. As the clamp reaches its extreme forward position the concave face of the block D strikes and presses the stiffener at and about its median line closely against and about the end of the heel-form. The downwardly and inwardly beveled sides of the block D enable the springs *s s* to be placed in an inclined position, so as to hug closely against the stiffener outside of the thinnest part of the heel-form, thus drawing it in to insure a proper adaptation of the upper or unflanged part of the stiffener to the natural heel.

Referring to Fig. 6, it will be seen that the heel-form is made narrower opposite the curved top edges, h^3, of the stiffener *h*. To enable the part h^3 of the stiffener to be fitted closely to the heel-form, the sides of the follower D from top to bottom are beveled inwardly, so that the lower edges of the springs *s* are closer together than their upper edges, and the springs inclined inwardly, as in Fig. 6, are enabled to fit the counter-stiffener closely to the tapered narrower thin parts of the heel-form.

I claim—

1. The heel-form, combined with the follower D and its attached springs *s*, to shape the stiffener to the heel-form, substantially as described.

2. The heel-form and the reciprocating follower D, combined with the springs *s*, and with screws to adjust them upon the follower, substantially as described.

3. The heel-form, made thinner below its upper part, upon which rests the flange of the counter-stiffener, combined with the springs having their lower edges inclined inwardly, to act upon the entire sides of the stiffener from its flanged portion to its curved or top edge, substantially as described.

4. The heel-form and the reciprocating follower, and springs to act directly upon the counter-stiffener placed on the said form, com-

bined with the reciprocating slide F, to iron and set the flange of the stiffener, substantially as described.

5. The heel-form, the reciprocating follower, and springs to act upon the outer sides of the counter-stiffener, and the slide F, to iron and set the flange of the stiffener, and the carriage to move the said slide, combined with means, substantially as described, to vary the downward pressure of the slide F upon the said flange.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES L. HATCH.

Witnesses:

G. W. GREGORY.
B. J. NOYES.

R. L. BREWER.
Book-Stitching Machine.

No. 208,287. Patented Sept. 24, 1878.

Fig.1.

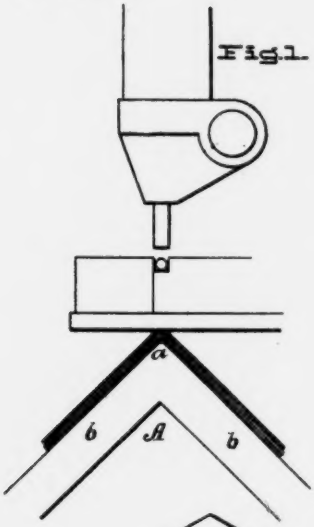


Fig.2.

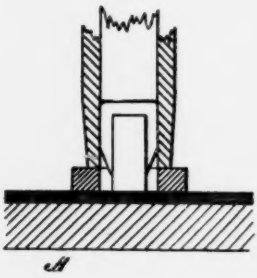
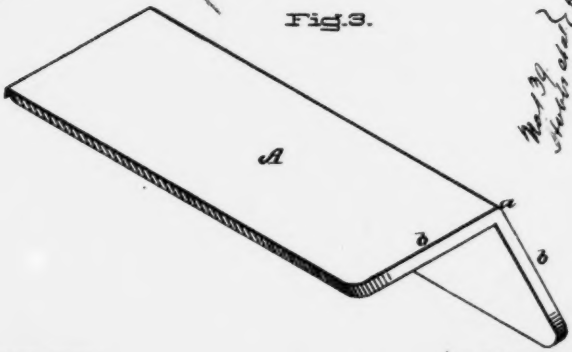


Fig.3.



Nov 13 Sheets also 6 Sht Brew.

WITNESSES:
Jas. F. Duhamel
M. J. Sullivan

INVENTOR
Roland L. Brewer
PER
H. C. Abbot
ATTORNEY.

505 UNITED STATES PATENT OFFICE.

ROLAND L. BREWER, of Milford, Connecticut, assignor to Henry G. Thompson, of same place.

Improvement in Book-stitching Machines.

Specification forming part of Letters Patent No. 208,287, dated September 24, 1878; application filed July 11, 1876.

To all whom it may concern:

Be it known that I, Roland L. Brewer, of Milford, in the county of New Haven and State of Connecticut, have invented certain new and useful improvements in book-stitching machines, of which the following is a specification:

My invention relates to that class of book-stitching machines in which wire staples are used to form the stitches, and it is especially designed as an improvement upon letters patent No. 168,736, dated October 11, 1875.

The nature of my invention consists in the construction of a table or anvil upon which the staple is clinched, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

(Here follows diagram marked p. 504.)

Figure 1 is an end view; Fig. 2, a longitudinal section, and Fig. 3 a perspective view.

In the drawing, A represents the table upon which the work is placed, and which acts as an anvil in receiving and turning the staples. Said table is made of a triangular block of any suitable material, having a longitudinal top edge, *a*, and inclined sides *b b*, and placed with its hypotenuse in a horizontal position. The work is laid on the table, which, owing to its form and position, will always cause the same to center itself and the two sides or leaves of the book be laid evenly on the inclined sides *b b*, thereby enabling the machine to stitch in the center of the fold.

The staples used with this device are constructed with points having the slant or incline on one side, so that when driven they will open passing through the material, and, striking the edge *a* of the anvil, bend and clinch.

Having thus fully described my invention, what I claim as new, and desire to secure by letters patent, is—

In a book-stitching machine, the table A made of triangular form, to receive the work, and cause the same to center itself and form a base or anvil upon which to clinch the staple, substantially as herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in the presence of two witnesses.

ROLAND L. BREWER.

Witnesses:

H. G. THOMPSON.

F. L. ALLIS.

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UNITED STATES PATENT OFFICE.

CHARLES LIEB, of New York, N. Y.

Machine for Stitching Books with Metallic Staples.

Specification forming part of Letters Patent No. 226,086, dated March 30, 1880. Application filed February 11, 1880.

To all whom it may concern:

Be it known that I, Charles Lieb, of New York, in the county of New York and State of New York, have invented a new and useful improvement in machines for stitching books with metallic staples, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

(Here follows diagram marked p. 508.)

Figure 1 represents my machine partly in front view and partly in section. Fig. 2 is an end view thereof. Fig. 3 shows the wire-cutter detached. Fig. 4 is a cross-section of one of the feed-slides. Fig. 5 shows the needle-lubricating device.

Similar letters indicate corresponding parts.

My invention relates to that class of machines in which a wire is intermittingly fed forward a certain distance and cut off, while the pieces so cut off are bent into the form of staples, then driven through the parts to be bound or stitched together, as the leaves of a book, and clinched.

My invention consists in certain novel combination of parts, hereinafter fully described, and pointed out in the claims.

The letters A B designate two reciprocating slides, by the joint action of which the wire is fed or propelled in the required manner. Each of these feed-slides carries a set of clamping-jaws, *c* or *d*, which are hung on pivots *e* or *e'*, and one of which is subjected to the action of a spring, *f* or *f'*, having a tendency to hold the same in engagement with its fellow jaw. The wire passes through between both sets of jaws *c d*, as shown in Fig. 1, and the jaws operate in opposite directions—that is to say, the jaws *c* hold the wire during the forward feed movement and release the same on the back movement, while the jaws *d* hold the wire during the back movement and release the same on the forward movement. For a detailed description of the operation of these jaws *c d*, I refer to the patent of R. L. Brewer, No. 169,081, dated October 26, 1875.

One feature of my invention consists in providing the adjacent ends of the jaws *c d* with beveled edges *g g*, so as to form on the free end of each jaw a single bearing-point for contact with and feeding forward the wire. By thus shaping the jaws *c d* they are caused to bear on only a small portion of the wire and to grasp the same firmly, whether it be straight or otherwise, whereas if the jaws have flat

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C. LIEB.

Machine for Stitching Books with Metallic Staples.

No. 226,086 **Patented Mar. 30, 1880.**

Fig. 1.

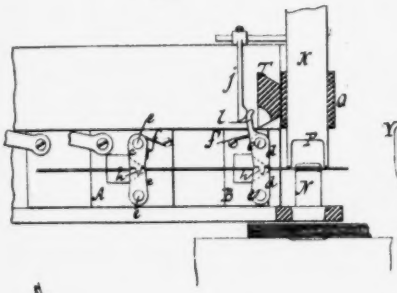
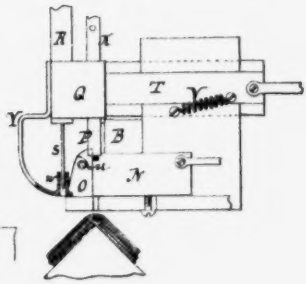


Fig. 2.



No. 39 Hubbard p. 508 Black

Fig. 3.

Fig. 4.

Witnesses.
Otto Supplee
William Miller

Fig. 5.

Inventor.
Charles Lieb
by
Van Santwood & Hauff
his attorneys

bearing-edges their operation is impaired by a twisted or irregular condition of the wire.

In order to cause the jaws *c d* to move in unison as they open and close, I construct one jaw of each pair or set with a tooth, *h*, entering a notch in the other jaw, this tooth being above or exterior of the bearing-edges *g g* of the jaws, as shown in Fig. 4, so that it does not interfere with the action of the jaws on the wire.

It will be seen that by the tooth *h* the two jaws of each set are practically geared together, and hence both jaws obtain a positive motion, while a single spring only is required to each set of jaws.

The angle upon the edges of the jaws *d* of the slide B is such that the jaws are adapted to cut the wire between them, and for the purpose of producing a cutting action of the jaws I combine therewith a mechanism for closing the same forcibly at the proper intervals. This operating mechanism consists of a pusher, *j*, which is attached to a vertically-reciprocating slide, K, and which acts on an arm, *l*, projecting from one of the jaws *d*; but the form of this mechanism may be changed.

By providing the jaws *d* with cutting-edges and combining therewith an operating mechanism said jaws are made to perform a dual function, and the construction of the machine is materially simplified.

The piece of wire cut off by the jaws *d d* is caught by a grooved horizontal slide, N, abutting against a block, O, and is then bent by the action of a plunger or former, P, which, in this example, is on the vertical slide K, carrying the pusher *j*.

The vertical or plunger slide K moves in a head, Q, in which moves also a second slide, R, carrying needles *s s*, and which is attached to a horizontal slide, T, working at a right angle to the feed-slides. By this horizontal slide T the head Q is alternately set to permit the action of the needles *s s* on the parts to be bound or stitched—say the leaves of a book—and to permit the action of the plunger P; and when a staple has been formed the staple-holding slide N recedes, so as to release the staple, whereupon a second plunger (not shown) descends and drives the staple through the book.

In the motions of the head Q, together with the horizontal slide T, the needles *s s* pass and repass the block O on its opposite sides. On the opposite sides of the block O, I arrange lubricating-pads *u* in such a manner that the needles *s s* touch and sweep across the surface of these pads in their movements from one position to another, and are thereby supplied with lubricating material.

The pads *u* are made of sponge or other absorbent material, and are supplied with oil or other lubricant, both pads being preferably made in one piece—namely, of a piece of material which is inserted in a hole in the block O, so as to project at both ends of this hole.

To the horizontal slide T, carrying the head Q, I connect one end of a spring, V, the other end of which is connected to a suitable part of the machine-frame. This spring V acts on the slide T with a tendency to force and hold the head Q and its attachments in one of its

positions, which may be either an inner or outer position, according to the direction in which the spring is arranged to act.

The needles *s s* work in guides *w w*, which are secured to a supporting-arm, Y, projecting from the head Q, so that the needle-guides move with the head and the needles, the result of which is, that the latter are sustained by the guides in either position of the head. In other words, the needle always remains within the guides.

What I claim as new, and desire to secure by letters patent, is—

1. The combination, with the reciprocating slides A B, of the pivoted clamping-jaws *c d*, having their adjacent ends beveled to form on each jaw a single bearing-point for contact with and feeding forward the wire, the beveled ends of the jaws *d* serving to cut the wire between them, substantially as and for the purpose described.

2. The combination, with the feed-slides A B, of the spring clamping-jaws *c d*, one jaw of each set constructed with a tooth, whereby it engages the other or fellow jaw, substantially as shown and described, for the purpose set forth.

3. The combination, with the feed-slide A, carrying spring clamping-jaws *c*, of the feed-slide B, carrying the spring clamping jaws *d*, having cutting-edges, and mechanism, substantially as described, for producing a cutting action of the jaws *d*, substantially as shown and described.

4. The combination of the block O, having the lubricating-pads *u*, with the needles *s s*, needle-slide R, head Q, and horizontal slide T, the whole constructed and adapted to operate substantially as described.

5. The combination of a horizontally-reciprocating head, Q, and the needle-slide R, passing through the head, and provided with needles *s*, of the depending arm Y, attached to and moving with the reciprocating head, and having its lower free end provided with needle-guides *w w*, within which the needles are at all times sustained, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 9th day of February, 1880.

CHARLES LIEB. [L. S.]

Witnesses:

W. HAUFF.

CHAS. WAHLERS.

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No 13g.
Hobbfield v. Back. } p 615

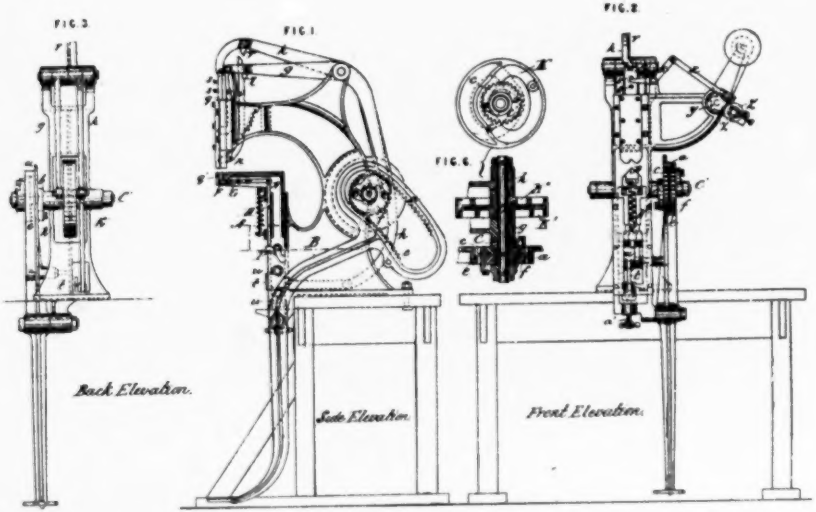

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FIG. 12.

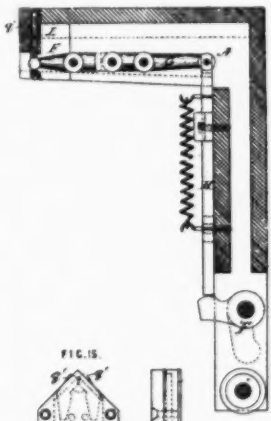


FIG. 13.

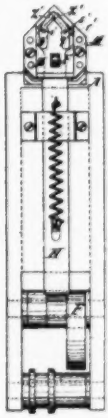
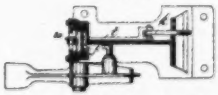


FIG. 15.

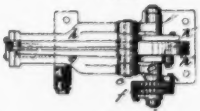
FIG. 14.

FIG. 4.



Horizontal section along A B.

FIG. 5.



Plan.

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Mr. Haddan's Sp. Dec.

FIG. 7.

FIG. 8.

FIG. 10

FIG. 9.

FIG. 11.

London: Printed by Eyre and Spottiswoode
Printers to the Queen's most Excellent Majesty.

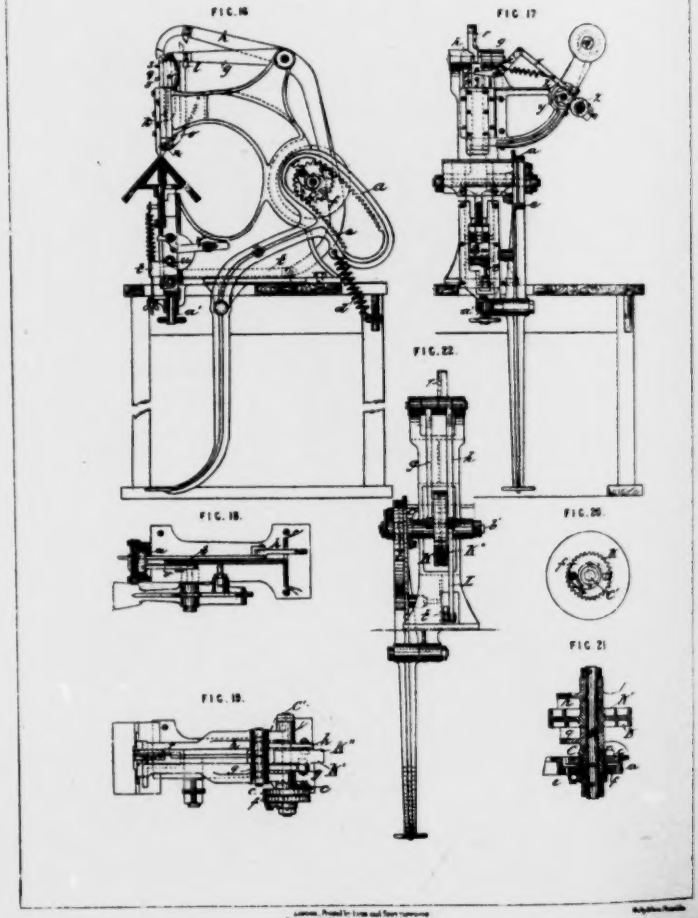
FIG. 16
FIG. 17
FIG. 22
FIG. 18.
FIG. 20.
FIG. 21
FIG. 19.

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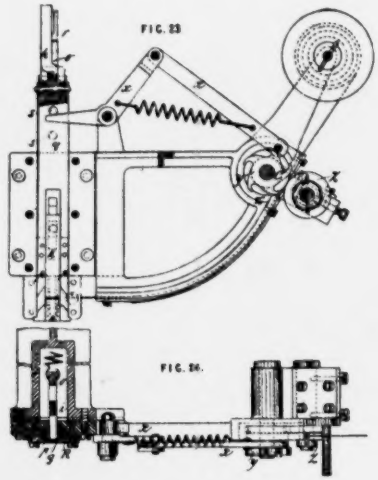
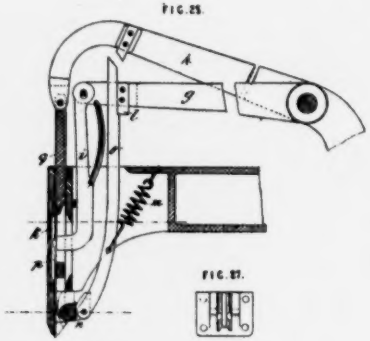




No. 139.
Hobbstat. p. 552
Beach.

511 A. D. 1884, 8th December. No. 16137.

Improvements in Wire-stitching Machines, or Machines for Binding Books and Similar Objects with Metallic Staples.

(Communicated from abroad by Carl Louis Lasch, of Rendnitz, in the Kingdom of Saxony, gentleman.)

Complete Specification.

I, Herbert John Haddan, of 67, Strand, in the city of Westminster, civil engineer, do hereby declare the nature of said invention for "improvements in wire-stitching machines, or machines for binding books and similar objects with metallic staples," a communication to me from abroad by Carl Louis Lasch, of Rendnitz, in the Kingdom of Saxony, gentleman, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

(Here follow diagrams marked pp. 515, 517, 519, 521, & 523.)

The improved wire-stitching machine is represented in the accompanying drawing Figs. 1 to 28 and differs from similar machines by the simple manner in which the same is operated, the motion of the treadle being sufficient to produce the staple, to force the same through the paper and to clench the same.

A great advantage, as compared with other machines of this kind, consists in the use of a bed or table arranged crosswise, so that no time is lost by withdrawing the book or paper, while the machine may be kept continuously at work, the book being directed from the left to the right across the table and subsequently delivered.

Another substantial improvement consists in the supply of the wire by means of rollers.

The machine may also be arranged for being operated by hand.

The machine works as follows: By a forward movement of the treadle mechanism the toothed segment *a* connected with the same imparts motion to the wheel *c* which is loosely mounted on the ratchet wheel *b* and provided with a pawl, whereby the eccentric K^{I} K^{II} mounted on the same axle, is turned for half a revolution. Thereupon the treadle with the segment is brought back into the original position by means of the spring *d*. During this motion the lower segment *e* gears into wheel *f*, which is also loosely mounted and provided with a pawl, so that the eccentric completes its full turn in one direction.

The levers *g* and *h* are operated by rollers travelling in curved grooves K^{I} and K^{II} of the eccentric.

512 To the lever *g* is attached by pin and slot the elastic lever *i* which engages into the stamper plate *k*, and also the stop *l* against which presses the lever *o* under the influence of the spring *m*, said lever *o* serving to set in motion the plier or anvil *n*.

To the lever *h* is attached the slide *q* provided with the knife and bending plate *p* and with the pins *s*, *s*; furthermore the stop *r* and at the base of the frame the rod *t*.

The forward motion of the treadle and the corresponding rotation of the eccentric with grooves K^{I} K^{II} causes the levers *g* and *h* to

move downward. The stop *l* presses the anvil *n* inward by means of the lever *o*, while the lever *i* simultaneously presses the stamper plate *k* downward on the wire, which has been introduced, and maintains the same.

At this moment the descending lever *h*, by means of the cutting and bending plates *p p* attached to the slide *q*, cuts off the wire and bends the same over the anvil.

During the further downward motion of the lever *h* and slide *q*, the lever *o* is disengaged by the oblique stop *r*, and the anvil *n* over which the staple has been bent is withdrawn by the spring *m*.

By the motion of the lever *h*, the wedge *t* has been drawn between the rollers *u*, and the layers of paper to be stitched have been brought towards the front end of the wire.

The lower roller *u* is controlled by the screw a^1 so that thin or thick layers of paper can be stitched.

The lever *g*, by means of the plate *k*, now forces the staple through the paper, after which the staple is bent by means of the bending apparatus, the lever connection *v*, and a stop attached to the treadle-rod.

The treadle thereupon recedes, all parts resume their previous position, and during the ascent of the slide *q* the rollers *z* are turned by means of the pins *s s*, the angle lever *x x*, and the ratchet wheel *y*, whereby fresh wire is supplied from a bobbin.

In order to stitch not only books from the side and through the fold, but also for connecting the edges of pasteboard boxes with each other, the machine is modified as follows:

Instead of the bed or saddle arranged crosswise and adapted to move upward, the machine is provided with an angular arm A having separate bending plates operated by special mechanisms.

This arm is arranged in such manner at the base of the main frame, that pasteboard of any depth may be placed on the same for the purpose of providing the ends with staples.

In order, however, to ensure the proper formation of the angles of the staples, the ordinary stamper-plate is replaced by a plate formed of two parts p^1 p^1 pivoted on pins *w* and adapted to be drawn apart by spring B. The plates have rounded edges D, which serve to push down the staples that have been finished above, and from under which the anvil *n* has been withdrawn, so that the ends of the staple arms are pressed towards the rounded recess E, whereupon the back of the staple is placed on the angle edge of the pasteboard box and at the same time bent by the oblique faces of the stamper and pressed into the walls of the box.

At the same time the binding plates of the arm A (which serve to bend the ends of the staples) are set in operation by means of the following mechanism:

In the interior of the arm and at the front end thereof are pivoted on pins s^1 s^1 the bending plates q^1 q^1 having the shape of angle levers.

The plates are pivoted in order that their ends D may be pressed in such manner against the ends k^1 k^1 of the staples, that the same are securely seized and pressed smoothly and straight into the walls of the pasteboard box. This peculiar motion of the bending plates q^1 is effected in the following manner:

By means of lever F (which is operated by the intermediate pieces G and H and the pusher I) the part L is shifted up and down, whereby the pins s^1 s^1, the small bearing r^1 and the bending
513 plates q^1 are operated at the same time, so that, when the bending plates descend, their ends press against the fixed oblique faces M, whereby the plates are slightly spread apart, so that their corners first press against the ends of the staples and bend the same; on further moving upward, the plates receive support at *z* and firmly press the staples against the inner walls of the paste-board box.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. The combination of two toothed segments *a*, *e*, with tooth wheels *c*, *f*, carrying pawls and mounted loose on shaft b^1 for the purpose of converting a circularly oscillating motion into a continuous rotary motion.

2. A saddle bed, laid crossways to the machine, and adapted to receive a short upward motion of variable length by means of wedge-shaped rod *t*, friction roller *u* and an adjusting screw a^1, for avoiding the forward motion and withdrawal of the book to be bound.

3. The combination of slide *q*, pins *s*, *s* and ratchet-lever mechanism *x*, *x*, for the accurate feeding of the wire by means of rollers.

4. A wedge piece *r* secured to the lever *h*, and a lever *o* adapted to act on the bending anvil *u* in such a manner as to obtain the withdrawal of the anvil at the required moment.

5. The combination of curved grooves or guides K^1 K^{11} mounted on a shaft and adapted to set in motion the entire mechanism.

6. An arm A, adapted to move up and down, and to carry the card-board boxes to be stitched, in combination with levers F, G and H enclosed in the said arm and serving to set in motion the bending plates q^1.

7. A pusher composed of two parts p^1 p^1 pivoted on pins *w* and held apart by spring B, said pushers having inclined surfaces D adapted to press the bent staple into the recess E and into the corner of the card-board box.

8. A pair of clenching plates q^1 q^1 placed in the arm or hollow platform A and adapted to be pressed apart by the oblique faces M M for the purpose of seizing with their edges the ends k^1 k^1 of the staple and completely pressing the same against the insides of the card-board box.

The whole substantially as described and illustrated and for the purposes specified.

Dated this 8th day of December, 1884.

H. J. HADDAN,
By HERBERT & CO.,
Agents, 67 *Strand*.

London: Printed by Eyre and Spottiswoode, printers to the Queen's most excellent majesty. For Her Majesty's stationery office. 1885. (P 11657—17—3/95—R 159. D & S.)
50—139

529 UNITED STATES PATENT OFFICE.

CHARLES A. MAXFIELD, of New York, N. Y.

Machine for Making Paper Boxes.

Specification forming part of Letters Patent No. 52432, dated February 6, 1866.

To all whom it may concern:

Be it known that I, Charles A. Maxfield, of the city and State of New York, have invented, made, and applied to use a certain new and useful improvement in machinery for making boxes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, wherein—

(Here follow diagrams marked pp. 526 & 528.)

Figure 1 is a side elevation of the said machinery. Fig. 2 is a section at the line *x x* of Fig. 1, and Fig. 3 is a section at the line *y y*. Similar marks of reference denote the same parts.

My invention relates to mechanism for pressing a strip of glued paper upon the edge of the box at the junction of the bottom and sides or rim and lid, so as to form a union of the circular end with the cylindrical side of the box; also, in a means for pressing upon the cylindrical sides of the box a strip of glued or pasted paper to form a covering for the same, and turning the edges of said paper over, the one edge upon the circular end piece and the other edge over and within the circular rim of the box or lid, thereby a strong box, smoothly covered, can be made with great rapidity.

In the drawings, *a* is the frame of the machine. *b* is a swinging auxiliary frame, carrying a box, *c*, that may be moved up or down in the said frame *b*, and retained by a set-screw, 1, for adapting the machine to the size of the box, as hereinafter shown. Through this box *c* is a tube, *d*, that may be slidden endwise through the box by a lever, *e*, upon a fulcrum-arm that projects from this box *c*; and *f* is a spring acting against a collar, 2, to force the tube *d* to the right, Fig. 1. Within this tube *d* is a shaft, carrying at one end the gear-wheel *g*, and at the other end the box-supporter *h*, that is held on by a screw, and may be removed and another substituted for a different size of box. In this case the gear *g* also has to be changed.

k is a shaft sustained at one end in the frame *a* and at the other end in the arm *a'*. This shaft *k* is rotated by the crank *l* and gears *m m'*, and a gear, *n*, is provided that takes the gear *g* to rotate the shaft *i* and box-supporter *h*. (See red lines in Fig. 3.)

On the frame *a* is an adjustable stud, *o*, carrying a disk, *p*, that can be rotated upon its shaft, that extends into the stud *o*.

r is a roller on *k*, covered with rubber or other elastic material, and *q* is a conical roller contiguous to *h* and *r*, supported on a screw or gudgeon from the projection *s*.

The operation of the parts thus far is as follows: The attendant, by the lever *e*, draws the box-supporter *h* away from the disk *p*, and

C. A. Maxfield. Sheet 1. 2 Sheets.

Paper Box Mach.

No. 52432. Patented Feb. 6. 1866.

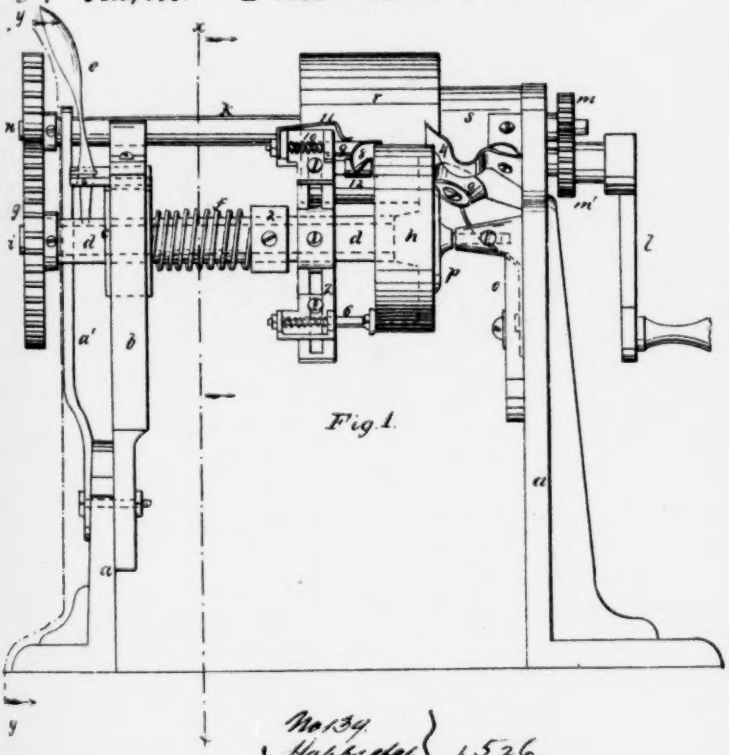


Fig. 1.

No 139.
Hobbs et al.
Bleach
p 526

Witnesses.

Lemuel W. Serrell

Chas. H. Smith

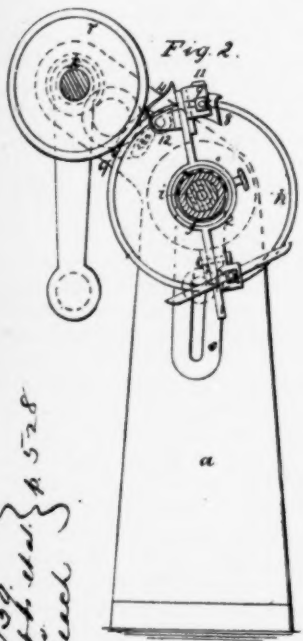
Inventor

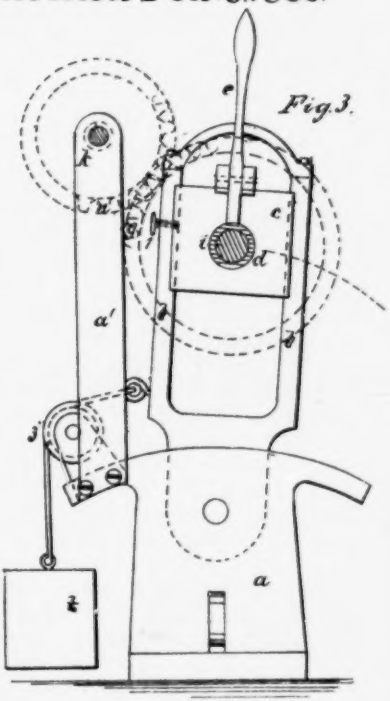
Chas. A. Maxfield.

C. A. Maxfield. Sheet 1. 2 Sheets.

Paper Box Mach.

No. 52432. Patented Feb. 6. 1866.





No. 139. Reissued Dec. 5. 1865.

Fig. 4.

Fig. 5.

Witnesses

Lemuel W. Serrell

Chas. H. Smith

Inventor

Chas. A. Maxfield.

swings the auxiliary frame *b* toward himself. This allows for the introduction of a circular rim to form a box or cover over and around the holder or supporter *h*, with a round piece of material to form the bottom of the box against the flat side of *h*. The parts are swung back to position, (a counterpoise, *t*, and pulley and cord 3 aiding in so doing,) and the spring *f*, pressing the box-bottom against the disk *p*, holds the same. A strip of glued or otherwise adhesive paper or material is now laid upon the angle at the junction of and lapping upon both the cylindrical side and flat bottom or end, and the handle *l* turned as the strip of adhesive material is guided. A folder, made of a piece of bent metal, as at 4, folds the edge of the strip toward and upon the edge of the circular bottom. This compression is completed by the roller *q*, while the roller *r* presses the said material firmly upon the side of the box. This strip of material forms a union of the bottom or top and sides of the box, as indicated in Fig. 4 by the blue line.

A sliding spring-holding bar, 6, on the arm 7 upon *d* may be employed to press the circular rim of the box toward the bottom, so that they may not separate during the rotation of the box and holder *h*.

In order to cover the box with paper or similar material it is only necessary to apply to the side of the box one end of a strip of pasted or glued material and rotate the parts, the roller *r* pressing the same against the side of the box while the turner 4 and roller *q* fold the edge over smoothly against the bottom, and at the same time a folder, 8, formed of a curved piece of metal set on a sliding stock, 9, with a spring, 10, to press it toward the edge of the box, and a spring, 11, to keep it down, turns or folds the edge of the material around into the inside of the box or lid, as seen by the
530 red lines in the section, Fig. 5, and I employ a roller, 12, which being inside of the edge of the box, presses the said paper smoothly down to its place.

By releasing the pressure of the box-holder *h* against the disk *p*, by means of the lever *e*, the auxiliary frame *b* may be swung sufficiently forward to allow of the removal of the box or lid and the introduction of the parts for forming another.

What I claim, and desire to secure by letters patent, is—

1. Mounting the box-supporter *h* in the sliding pipe sustained in the swinging frame *b*, for the purpose of allowing the box to be placed upon or removed from the supporter *h*, substantially as specified.

2. The folding-guide 4, in combination with the supporter *h*, and rollers *r* and *q*, for the purpose and as specified.

3. The roller 12, and guide or folder 8, in combination with the box-supporter *h*, and roller *r*, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature this 8th day of September, A. D. 1865.

CHAS. A. MAXFIELD.

Witnesses:
LEMUEL W. SERRELL.
CHAS. H. SMITH.

535 UNITED STATES PATENT OFFICE.

SILAS B. TERRY, of Terryville, Connecticut, assignor to Silas B. Terry, Jr., of same place.

Machine for Making Paper Boxes.

Specification forming part of Letters Patent No. 25373, dated September 6, 1859.

To all whom it may concern:

Be it known that I, Silas B. Terry, of Terryville, in the county of Litchfield and State of Connecticut, have invented a new and useful machine for manufacturing paper boxes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

(Here follow diagrams marked pp. 532 & 534.)

Figure 1 is a front view of my invention; Fig. 2, a transverse, vertical section of the same, taken in the line *x x*, Fig. 3. Fig. 3 is a plan or top view of the same; Fig. 4, a longitudinal section of the shell or case which contains the cylindrical head to which the end pieces of the boxes are attached; *y y*, Fig. 3, indicates the plane of section; Fig. 5, a perspective view of the device by which the side strips of the boxes are covered; Figs. 6 and 7, transverse section of the same, taken in the line *z z*, Fig. 5. Fig. 8 are views of the several parts of a box that are operated on by this invention; Fig. 9, a vertical central section of a paper box such as are constructed by my invention.

This invention relates to a machine that is designed to facilitate the manufacture of circular paper boxes; and it consists in the employment or use of a rotating clamp, gage, or socket, discharging-ring, pressure-roller, and guide, the above parts being arranged substantially as hereinafter described, and used in connection with a folding-device, whereby the manufacture of the above-named boxes is greatly expedited and the work done in a perfect manner.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a base or platform, to which four uprights, *a b c d*, are secured. The uprights *a b* form supports for a mandrel, B, which has a crank, *e*, on its outer end and a circular disk, *f*, on its inner end, said disk having spurs *g* attached to its face side, as shown clearly in Fig. 4. The mandrel B is allowed to rotate and also to slide longitudinally in its bearings. The uprights *c d* form supports for a mandrel, C, the inner end of which has a cylindrical head, D, attached, with spurs *h* on its face or end, and pins *i* projecting from its periphery to serve as stops to a ring or band, E, which is fitted loosely on the head D. The upper end of the sup-

S. B. Terry. Sheet 1. 2 Sheets.

Paper Box Mach.

No 25373. Patented Sept. 6. 1859.

Fig. 1

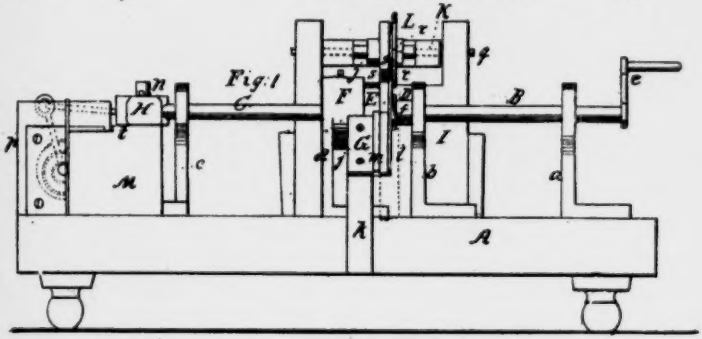
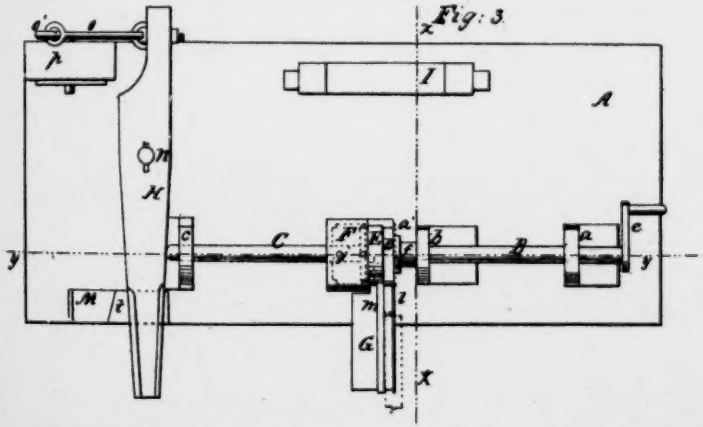


Fig. 3



Witnesses
Irene Gaylord
O. S. Wilson

No 139 Hotchkiss p. 532 Beach

Inventor.
Silas B. Terry

S. B. Terry. Sheet 2. 2 Sheets

Paper Box Mach.

No. 25373. Patented Sept. 6. 1859.

No. 13a Hollister, 6. Sept. 1859 Book

Fig: 2

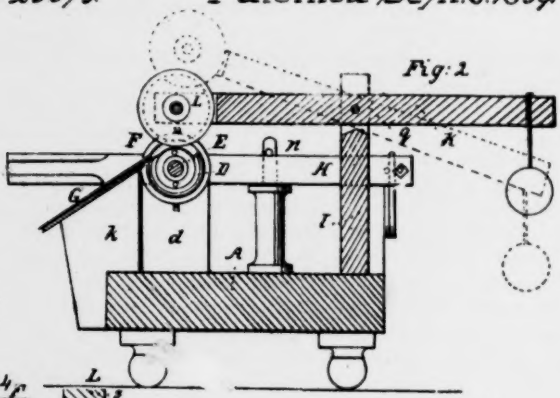


Fig: 4

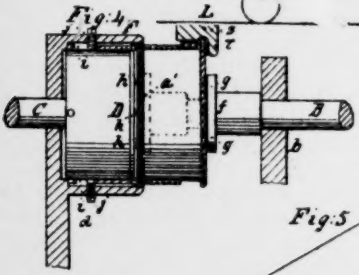


Fig: 8

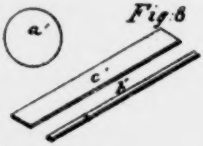


Fig: 5

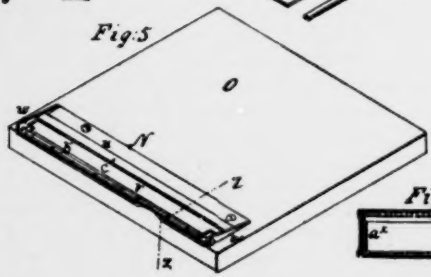
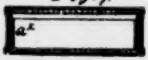


Fig: 6

Fig: 7

Fig: 9



Witnesses

Levin Gaylord

D. S. Wilcox

Inventor

Silas B. Terry

port *d* is provided with a cylindrical socket, F, in which the head D is allowed to slide freely, and through the socket F screws or pins *j* pass, the use of which will be presently explained. The mandrel C is also allowed to turn freely and slide longitudinally in its bearings.

To the front part of the base or platform A an upright, *k*, is attached, and on the upper end of this platform an inclined plate G, is secured. The plate G has a flange, *l*, turned up at one edge, and a ledge, *m*, is secured to the plate parallel with the ledge, as shown clearly in Figs. 1 and 3.

H is a lever which is fitted on a fulcrum, *n*, on the base or platform. This lever is connected at one end by a link, *o*, and lever *o'* to a coil-spring fitted in a box, *p*, on the platform. In Fig. 1 the coil-spring is shown by dotted lines.

To the upper surface of the base or platform A an upright, I, is attached. This upright has a bar, K, fitted on an axis, *q*, in its upper part. In the front end of this bar K a pressure-roller, L, is placed. The periphery of this roller is provided with a flange, *r*, and a recess, *s*, as shown clearly in Figs. 1 and 4. The back end of the bar K has a weight attached, said weight having a tendency to keep the front end of the bar elevated. An upright, M, is attached to the front part of the base or platform, said upright having a ledge or shoulder, *t*, on its upper surface to serve as a stop for lever H.

N, Figs. 5, 6, and 7, represents a metal plate attached to a base, O. This plate has a ledge, *u*, secured longitudinally to it, and a bar, *v*, is attached to the front part of plate N by pivots *w w*, as shown clearly in Fig. 5, said pivot permitting the bar *v* to fold over on plate N, as shown in Fig. 7.

The operation is as follows: The circular pieces of pasteboard *a'* (see Fig. 8) which form the end pieces of the boxes are previously cut out by any suitable machine, and the long rectangular strips of pasteboard *b'* as well as the white strip of thin paper C' are also previously cut by machinery. The above parts constitute
536 the stock which my invention works up. The circular pieces of pasteboard *a'* are covered at one side with white paper, this work being also previously done. The operator first throws back the lever H so that it will bear against the stop *t*, and then throws back the mandrel C so that the head D will be within the socket F, as shown in black, Fig. 4. A piece of pasteboard, *a'*, is then inserted in the socket F, the inner diameter of which is just the size to receive it. (See Fig. 4.) The pasteboard *a'* is placed against the face or end of the head D, and the disk *f* is then shoved against the pasteboard, which is consequently secured by the spurs *g h* between the head and disk. The lever H is then elevated above the ledge or shoulder *t*, and the coil-spring in the box *p* forces the head D out from the socket F, as shown in black in Figs. 1 and 3 and in blue in the enlarged section, Fig. 4. The operator now takes a slip, *c'*, of thin white paper and places it on the plate N, one edge being against the ledge *u*. This paper *c'* is then pasted on its upper surface, and a strip, *b'*, of pasteboard is placed on the paper *c'* directly over the bar *v*. The bar *v* is then turned over, as shown

in Fig. 7, and the pasteboard strip b' will be covered with the strips c' of white paper, a projecting edge or margin of the latter being left. The covered pasteboard strip b' is then placed on the inclined plate G, the ring E on the head D being shoved back so that it bears against the pins or stops i. The bar K is then turned down and the roller L bears on the head D. The operator then turns the mandrel B by hand and the circular pasteboard a' is rotated and the covered pasteboard strip b' drawn between the roller L and the head D, the flange r of roller L turning the margin of the thin strip of paper c' over the edge of the circular piece of pasteboard a', and thereby connecting the strip b' with the circular piece a', the latter forming the top or bottom of the box and the former part of its side, each box being formed of two parts constructed precisely similar, one portion, which forms the lid or cover, fitting over a strip, $a\times$, pasted within the other portion, which forms the lower part of the box. (See Fig. 9.) The roller L while performing its work is pressed down on the head D by hand.

From the above description it will be seen that the invention connects the circular parts a' with the strips b', said parts forming the tops and bottoms and sides of the boxes, the remaining work—such as the pasting of the strip $a\times$ in one part—being done by hand, as also the covering of the boxes, if desired, with colored paper. When the parts a' are connected with the parts b' of the box, the lever H and mandrel C are forced back by hand, the head D passing within the socket F, and the band E, being arrested by the screws or stops j, serves to force the part of the box just formed off from the head D. The band E therefore serves as a discharging device as well as a gage.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

1. The pressure-roller L in connection with the rotating clamp formed of the head D and disk f, arranged substantially as and for the purpose set forth.

2. In combination with the pressure-roller L, head D, and disk f, the ring or band E, provided with the pins or strips i, the socket F, provided with the screws or pins j, and the guide-plate G, arranged for joint operation as and for the purpose described.

3. The arrangement of the pressure-lever H and sliding mandrels B C, for the purpose specified.

4. The employment or use of the folding device, formed of the plate N, provided with the ledge u and the pivoted bar v, when said folding device is used in connection with the pressure-roller L, rotating head D, and disk f, for the purpose set forth.

SILAS B. TERRY.

Witnesses:
A. S. WILSON.
SERENO GAYLORD.

16652

(No Model.) 3 Sheets—Sheet 1.

C. T. WELCH.

Addressing Machine.

No. 236,387. Patented Jan. 4, 1881.

Fig. 1.

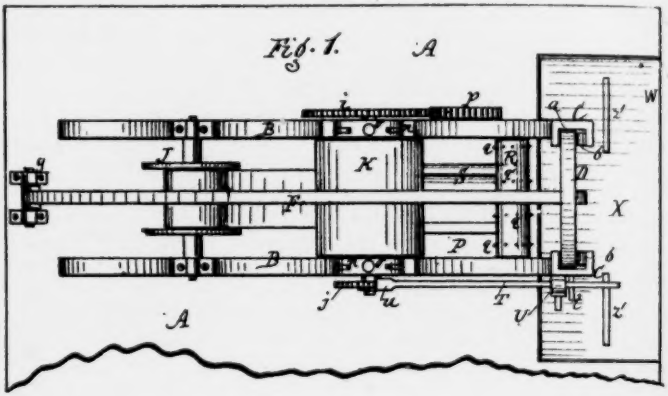
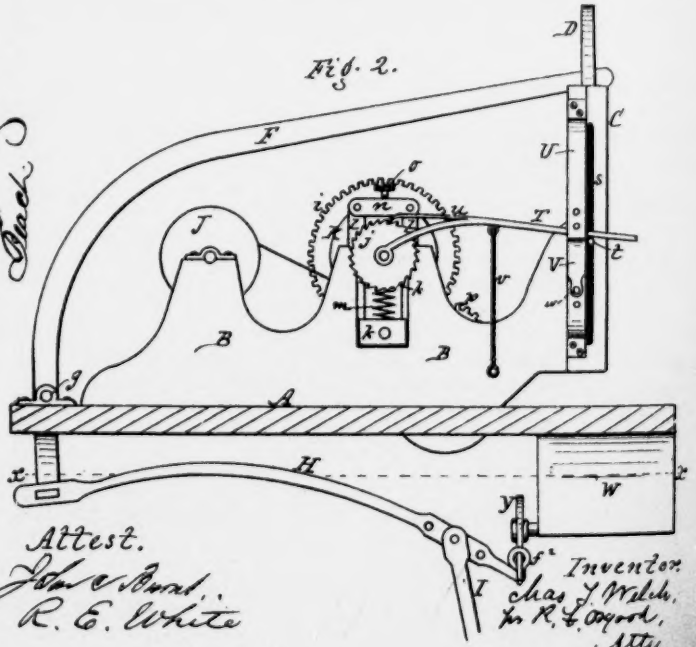


Fig. 2.



Attest.
John C. Board,
R. E. White

Inventor.
Chas. T. Welch,
by R. F. Osgood,
Atty.

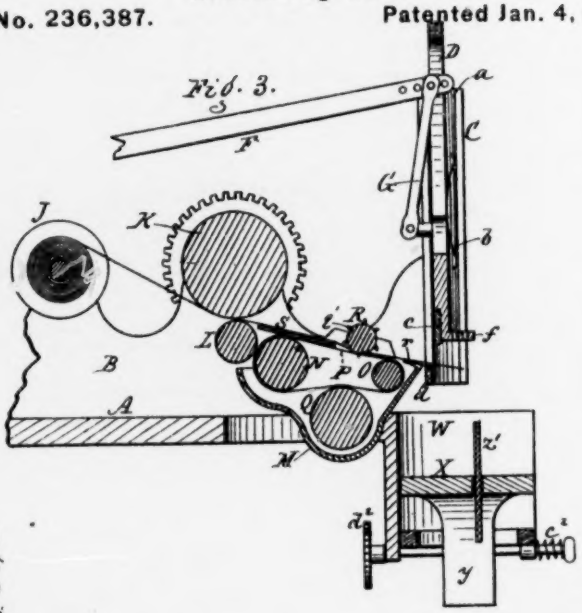
(No Model.) 3 Sheets—Sheet 2.

C. T. WELCH.

Addressing Machine.

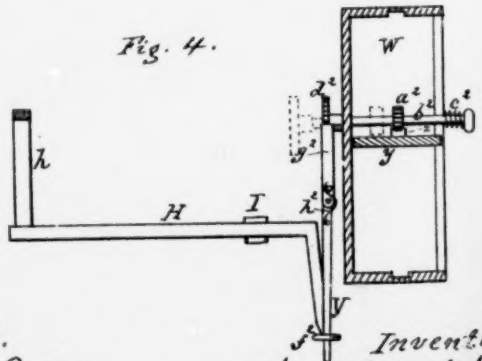
No. 236,387. Patented Jan. 4, 1881.

Fig. 3.



No. 239 Hubbard p. 540 Rack

Fig. 4.



Attest.
John C. Burns.
R. E. White

Inventor.
Chas. T. Welch.
per R. T. Osgood.
Atty.

(No Model.) 3 Sheets—Sheet 3.

C. T. WELCH.

Addressing Machine.

No. 236,387. Patented Jan. 4, 1881.

Fig. 5.

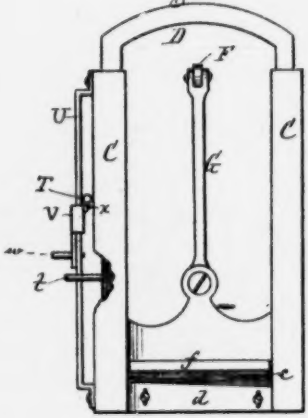


Fig. 6.

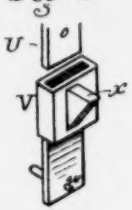


Fig. 7.

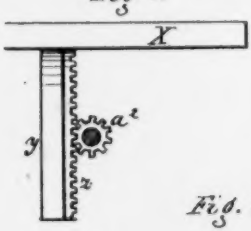


Fig. 8.

Fig. 4

Attest.
John C. Brent.
R. E. White

Inventor.
Chas T. Welch.
by R. F. Osgood.
Atty.

543 UNITED STATES PATENT OFFICE.

CHARLES T. WELCH, of Bellona, New York.

Addressing-machine.

Specification forming part of Letters Patent No. 236,387, dated January 4, 1881. Application filed April 6, 1880. (No model.)

To all whom it may concern:

Be it known that I, Charles T. Welch, a citizen of the United States, residing at Bellona, Yates county, New York, have invented a certain new and useful improvement in addressing-machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

(Here follow diagrams marked pp. 538, 540, & 542.)

Figure 1 is a plan of the machine. Fig. 2 is a side elevation. Fig. 3 is a longitudinal vertical section. Fig. 4 is a horizontal section on line *x x* of Fig. 2, looking downward. Fig. 5 is a front elevation of the head-frame and sliding gate. Figs. 6, 7, 8, and 9 are detail views.

My improvement relates to machines for addressing newspapers and other papers; and it consists in the construction and arrangement of parts hereinafter more fully described and claimed.

In the drawings, A represents a table or frame, which is mounted on legs to support the parts. B is the frame of the machine, which is secured on top of the table, and C is a vertical head-frame or way, in which slides the gate or carrier which carries the knife. This head-frame consists of two upright standards having grooves *a a*, in which the gate rests.

D is the gate or carrier, resting in the frame and pressed back against the rear or inner sides of the grooves by means of bow-shaped flat springs *b b*, which rest between the gate and the front sides of the grooves, thereby keeping the gate tight to its work.

c is the knife, attached to the bottom of the gate, and *d* is a shear-plate, attached at the bottom of the standards B B, so that the knife, in passing the shear-plate, will be pressed close up to its work to produce a perfect cut. The shear-plate is made somewhat inclined on its upper edge in order to produce a shearing cut, and it is also made adjustable up and down by means of slots through which pass set-screws, securing it in place. The springs *b b*, by being made in the form described and located in the grooves of the frame, ride easily up and down with the gate and always hold the knife up to its work, so that the cut of the knife will be perfect.

f is a platen or follower, located on a level with or just above the edge of the knife and projecting out horizontally from the lower end of the gate. As the slip is cut from the strip this platen catches it,

carries it down, and presses it upon the paper below, the strip having been previously gummed or pasted, as will presently be described. The body of the platen is filled with perforations to allow escape of imprisoned air as the platen presses upon the paper.

F is a curved arm, similar in shape to a sewing-machine needle-arm. This arm is pivoted at *g* at the rear of the machine, and with its front end is connected a pitman, G, pivoted at the lower end to the gate D, by which said gate is operated. The rear end of the arm passes through the table, and at the bottom extends out laterally and horizontally, as shown at *h*, Fig. 4. To this lateral extension is attached an arm, H, forming a crank-arm, and to this crank-arm is pivoted a pitman, I, extending to the bottom of the machine and connected with a treadle. (Not shown in the drawings.) By this means the arm and the gate are driven by the foot of the operator.

J is a reel, upon which is coiled the paper strip containing the addresses in successive order which are to be cut and pasted upon the papers.

K and L are two feeding-rollers, between which the paper strip is fed to the pasting apparatus. The upper roller is of considerable size, and on one end of its shaft is a spur-gear wheel, *i*, while on the other end is a ratchet-wheel, *j*, all clearly shown in Figs. 1 and 2. The small roller L has no gear, but is turned by the friction. The journals of both these rollers rest in boxes *k k*, Fig. 2, which slide on bars *l l*, forming ways, and the boxes are pressed apart to admit the paper strip between them by means of spiral springs *m m*. The bars *l l* at the top are pivoted to head-blocks *n n*, and through these head-blocks pass set-screws *o o*, which press down on top of the boxes of the upper roller, K. By this means it will be perceived the boxes of the two rollers may be pressed toward each other to produce the desired pressure on the paper strip to feed it forward, and yet the rollers will be forced apart to a certain extent by the spiral springs between the boxes, before described.

544 M is a cup, forming a paste or water cup, which is set into a hole in the table in front of the feeding-rollers above described, and between them and the cutting apparatus, said cup being set into place from below. N is a roller in the upper rear portion of this cup, near the lower feed-roller, L, and so located as to receive the paper strip above it. On one end of the shaft of this roller is a spur-pinion, *p*, which gears with the spur-wheel *i* and receives its motion from it. O is a small roller at the opposite end of the cup and near the cutting apparatus. Around these two rollers passes an endless rubber band or apron, P, which receives forward motion by the roller N.

Q is a roller in the deepest part of the cup, and midway between the rollers N O. This roller Q is free to move up and down by its own accord; but it has short journals, which rest in vertical grooves in the sides of the cup, by which it is kept in proper position. It bears against the under side of the rubber band which passes over it, and when paste or water is in the tank it wets the surface of the band, which, when it passes over, also correspondingly wets the

bottom of the paper slip that passes over the band. Being free in its movements, said roller Q will always adapt itself to the band, and will be sure to properly cover the same with paste or water.

R is a small roller, located above the band between the rollers N O. It has on its periphery two sets of sharp-pointed spurs q q', at each end. The outer set of spurs, by striking into the rubber band, impart motion to the roller, while the inner set of spurs, by striking into the paper slip, give forward motion to the slip itself and keep the latter taut and straight upon the apron, so as to get the best effect of the pasting or wetting action. I would say here that either paste or water may be used in the cup. In case the paper slip is ungummed, then paste is used in the cup to paste the under surface of the slip to render it adhesive; but is case the slip is previously gummed preparatory to use, then water is used in the cup simply to moisten the gum. The two sets of spurs in roller R are quite essential to feed the slip forward and prevent it from wrinkling under these circumstances. The rear or outer edge of the cup is provided with a series of teeth, r r, which project back close to the turn of the endless band and bridge over the sp ace between the apron and the shear-plate, said teeth receiving the end of the slip as it moves forward, preventing it from falling into the throat at the end of the band and conveying it properly to the cutting apparatus.

S is a plate, forming a guideway to the paper strip as it issues from the feeding-rollers to the pasting-band, said guideway carrying the strip over the throat at the junction of the rollers L N and conveying it to the pressure-roller R.

T is a rock-arm, jointed to turn on the axis of ratchet-wheel j, said arm projecting outward and passing through a guideway, U, secured to the upright head-frame C. In the standard is made a long vertical slot, s, Fig. 2. A pin, t, attached to the gate passes through this slot and rests under the rock-arm T. It will be seen that as the gate moves up and down the rock-arm will correspondingly be raised and lowered in the guideway U.

u is a spring-pawl resting on the arm T and engaging with the teeth of the ratchet-wheel. In every up motion of the rock-arm the ratchet-wheel will be moved forward by the pawl, and in every down motion the pawl will retract to obtain a new hold.

v is a rubber or other spring attached to the rock-arm and the frame for the purpose of producing the reaction of the rock-arm.

V is a gage-slide attached to the guideway U, and capable of adjustment higher or lower thereon by means of a pin, w, on its bottom, which strikes into any of a series of holes in the guideway, or by other means. This gage-slide has a stop, x, which rests in the guideway under the rock-arm and stops the rock-arm in its downward motion, at whatever height the gage may be set. By this means the pawl u may be made to move the ratchet forward either one or two or more teeth at each throw, as may be desired, thereby also making a correspondingly greater or less movement of the paper slip, to enable a greater or less width to be cut by the knife, which is necessary in addresses of greater or less width.

W is a square cavity or socket of considerable depth beneath the cutting apparatus, said cavity being formed in the table for the purpose of receiving a pile of the papers on which the addressed labels are to be pasted. X is a follower or bed in said cavity, which forms the support for the papers. The ends of the follower have tenons which run in vertical grooves of the frame to enable the follower to move up and down, or they are otherwise prepared to allow vertical movement of the follower. *y* is a vertical bar on the under side of the follower, and *z* is a rack-bar attached to it.

a^2 is a pinion which engages with the rack, and is located on a shaft, b^2, by which motion is imparted to it. The shaft is capable of end motion in order to throw the pinion out of engagement with the rack, as indicated by the dotted lines in Fig. 4. This allows the follower to be run down to the bottom of the cavity after it has been elevated. The shaft b^2 has a spring, c^2, on the outer end to retract the shaft.

d^2 is a ratchet-wheel on the inner end of shaft b^2.

Y is a rock-arm, jointed at one end to turn on shaft b^2, the other end extending outward and passing through a loop, f^2, on the end of arm H.

g^2 is a pawl on the arm Y, which engages with the ratchet-wheel d^2 and gives motion to it at each reciprocation of the operating-arm F, thereby raising the follower X step by step. The pawl g^2 is pivoted at the rear end, so that it can be turned off sidewise to disengage from the ratchet, in which case the follower may be held stationary for the purpose of labeling separate papers when desired. The pawl is held in engagement with the ratchet by a spring h^2.

Z′ Z′ are division-plates which pass through the follower X, resting in slots therein, the plates being stationary while the follower slides over them. The object of these plates is to enable smaller papers to be held in place than would occupy the whole surface of the follower. Small papers may be placed in the space between the division-plates and the back of the chamber, while large ones may occupy the whole chamber by simply removing the division-plates.

From the above description the operation will be readily understood. The strip of paper having the addresses printed thereon in successive order is fed through the feed-rollers and drawn to the cutting apparatus by the spur-pointed roller R and the endless band, and in its passage is pasted or wet on the under side. The knife cuts each address-slip from the strip, and the platen *f* carries it down and pastes it upon the paper. A pile of the papers is placed in the cavity W on the follower X, which latter feeds up as fast as the papers are addressed and removed.

By the use of the gage V the feeding motion of the strip can be changed to cut wide or narrow labels.

By taking hold of the spur-wheel *i* and moving it forward the ratchet *j* will slip under its pawl, and additional feeding motion will be given to the paper strip in proportion to the movement imparted to the wheel.

It is frequently the case that wide addresses are interspersed with

or follow narrow ones, and the operator, by watching the feeding of the strip, can turn the wheel by hand at any time, so as to compensate for the difference in width, and thereby prevent the mutilation of the addresses.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

1. In an addressing-machine, the combination, with the feeding-rollers K L and band-roller N, said rollers K N being provided with the gear-wheels *i p*, the ratchet-wheel *j* on the shaft of roller K, the rock-arm T and pawl *u*, engaging with the ratchet, the guideway U, through which the end of the rock-arm passes, the pin *t*, attached to the gate and resting under the arm for elevating it, and the gage-slide V, adjustable to different positions on the guideway and provided with the stop *x* to gage the downward movement of the rock-arm, as herein shown and described.

2. In an addressing-machine, the cup M, containing the rollers N O Q R, and provided with the teeth *r*, bridging the space between the endless band and cutting apparatus, as herein shown and described.

3. In an addressing-machine, the combination, with the endless band P, running over the rollers N O and gummed or wetted by the roller O, of the pressure-roller R, provided with the two sets of spurs *q q'*, one set of which engages with the endless band to transfer motion from the band to the roller and the other set of which engages with the paper slip to transfer motion from the roller to the slip, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES T. WELCH.

Witnesses:
D. S. YORK.
W. H. COLEMAN.

551 UNITED STATES PATENT OFFICE.

JOHN DENNIS, JR., of Rochester, and DELOS S. YORK, of Geneva, assignors to Peter York, of Geneva, New York.

Addressing-machine.

Specification forming part of Letters Patent No. 303,922, dated August 19, 1884. Application filed September 4, 1882. (Model.)

To all whom it may concern:

Be it known that we, John Dennis, Jr., of Rochester, Monroe county, New York, and Delos S. York, of Geneva, Ontario county, New York, have invented certain new and useful improvements in addressing-machines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

(Here follow diagrams marked pp. 548 & 550.)

Figure 1 is a plan of the machine. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a front end elevation, the lower portion being in section. Fig. 4 is an elevation of a portion of the machine looking on the opposite side from Fig. 2. Figs. 5 and 6 are detail views showing the apparatus for changing the feed. Fig. 7 is a view of a portion of one of the printed strips containing the addresses.

This improvement relates to addressing-machines in which a strip of paper with the addresses printed thereon is run through the machine, the addresses being cut off in slips and automatically affixed to the newspapers, envelopes, or other articles by a descending knife and platen.

The object of the invention is, first, to change or adjust the feed automatically by the running of the machine itself, so that addresses of greater or less width can be cut accurately without attention of the operator, the machine adjusting itself exactly to the work to be done; and, second, to enable the addresses to be affixed to single sheets beneath the platen, or to a greater or less thickness of sheets, all as hereinafter described. Means have heretofore been used for effecting the last-named purpose—such, for instance, as that described in letters patent No. 236,387, dated January 4, 1881; but we have invented greatly improved means for effecting the purpose.

In the drawings, A shows the frame upon which the working parts are mounted.

B is the paste-tank, set into the frame and provided with feeding-rollers C C, which feed the printed strip along from the reel D, upon which it is wound.

E E′ are the pasting-rollers which paste the under side of the strip.

F is a flat bar, over which the strip passes before entering between

Dennis & York Patent, No. 303,922. See Vol. I, page 223.

(Model.) 2 Sheets—Sheet 1

J. DENNIS, Jr. & D. S. YORK.

ADDRESSING MACHINE.

No. 303,922. Patented Aug. 19, 1884.

Fig. 1.

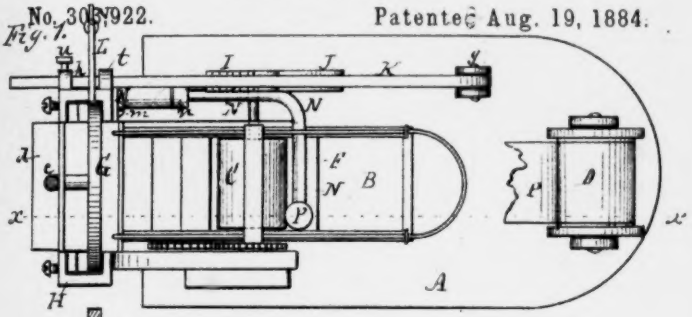
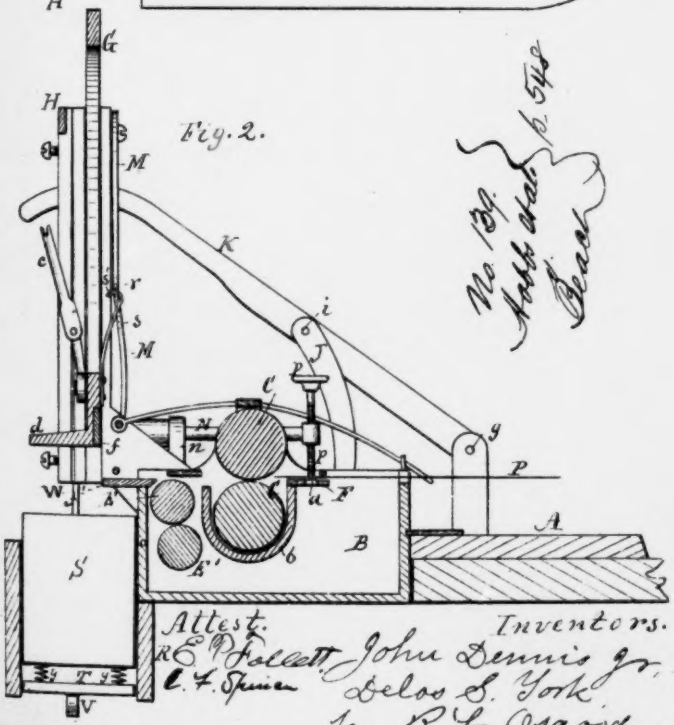


Fig. 2.



Attest.
R. E. Wolcott
C. F. Spencer

Inventors.
John Dennis Jr.
Delos S. York
per R. F. Osgood
Atty.

(Model.) 2 Sheets—Sheet 2.

J. DENNIS, Jr. & D. S. YORK.

ADDRESSING MACHINE.

No. 303,922. Patented Aug. 19, 1884.

Fig. 3.

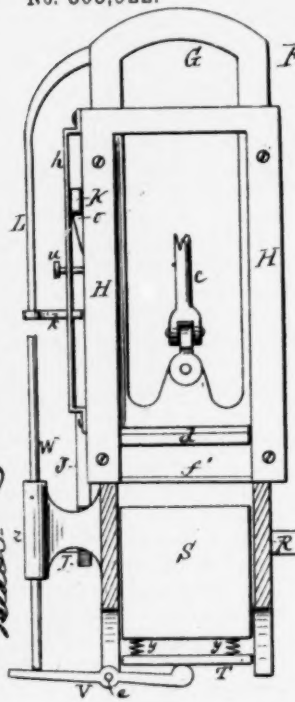


Fig. 4.

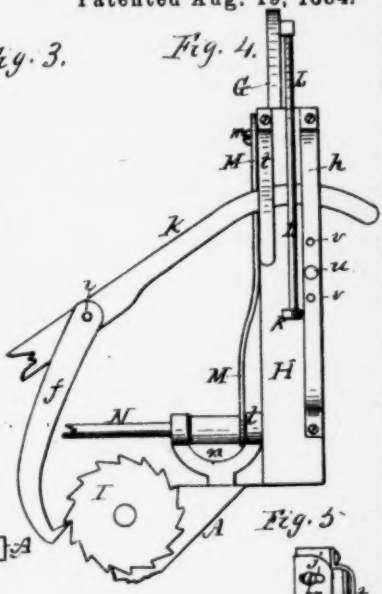


Fig. 5.

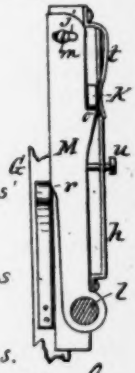


Fig. 6.

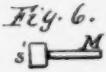
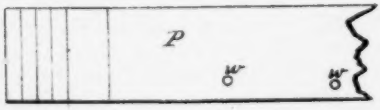


Fig. 7.



Attest:
C. P. Follett
C. F. Spencer

Inventors.
John Dennis Jr.
Silas S. York.
per R. F. Osgood.
atty.

feed-rollers, and this bar is provided with a hole *a*, through
h the pin passes to change the feed, as will presently be de-
ed. *b* is a curb beneath the feed-rollers, the construction of the
-tank and its connections being the same as that shown in the
nt of York and Uhl, September 26, 1882.
is a vertically-reciprocating gate, which rests in ways H H, and
perated by a pitman, *c*, or any other suitable means. At its
r end is a platen, *d*, by which the cut addresses are carried
n and affixed to the papers, envelopes, or other articles beneath;
a knife, *f*, which acts in conjunction with the fixed shear *f'*, by
h the addresses are cut from the strip.
s a ratchet-wheel on the shaft of the lower feed-roller, C.
is a rock bar or lever pivoted, at *g*, to a bearing rising from
rame, the opposite end passing through a guideway, *h*, at the
of one of the standards H, which retains it in position against
tandard, but allows it to rise and fall.
s a weighted pawl pivoted at *i* to the lever, its lower hooked
ngaging with the ratchet as the pawl is raised.
is an arm attached to the gate, extending down vertically out-
the frame, and provided with a right-angled finger, *k*, which
nds inward and rests under the lever K, as shown in Fig. 3.
he gate is raised, the lever K will also be raised by the finger *k*
ng under it, and as the gate falls the lever will fall of its own
ht. By this means a regular intermittent motion is given to
eed-rollers, which feed the printed strip forward to the knives.
is a rock-arm, pivoted at *l* to one of the guide-standards H,
having a lateral vibration to a limited extent around said pivot.
movement is limited at the top by a screw, *m*, which passes
gh a slot, *j*, of the rock-arm, Fig. 5.
is a curved arm or elbow mounted in bearings of a U-shaped
bracket, *n*, attached to the rock-arm on its pivotal center, and
extending around in rear of the upper feed-roller, C, and its
end resting over the hole *a* in the bar F. Through this end
s a pin, *p*, which rests on top of the printed strip and directly
said hole. This pin is preferably a screw, as shown, which
e turned up or down to adjust its length. As the arm M is vi-
d upon its pivot, the arm N will be correspondingly rocked
he pin *p* be raised.
a square shoulder, forming a stop on the outer edge of the
M.
an incline, forming a cam-face on the inner edge of said arm.
a spring attached to the gate, moving up and down with it,
having a hook-shaped head, *s'*, which bears against the inner
of the arm.
a flat spring on the outside of the standard H, open at its bot-
which presses in against the lever K, opposite the stop *o*, and
the lever against the standard, so that it will catch the stop
lling. *u* is a removable pin, which fits in any of a series of
v v, in the guide *h*, and forming also a stop to the fall of the

s the strip of paper upon which the addresses are printed

These are printed at regular distances apart with spaces between, except that occasionally some addresses are longer and occupy more printed space than others. In such case, in conjunction with such long addresses, the printed strip has holes *w w*, which come in line with the hole *a* in the bar F and with the pin *p* as the strip passes over.

The operation of this part of our invention is as follows: As the printed strip passes through the machine the pin *p* rests on top of it, and the rock-arm M is consequently thrown out, so that the lever K in its fall will strike on the stop *o* and be gaged by it. In this case the throw of the lever is just sufficient to cause the pawl J to engage with and move the ratchet-wheel I forward one notch, thereby feeding the strip forward between the knives just the width of the narrowest address. When one of the holes *w* in the printed strip comes beneath the pin *p*, the latter will drop through the hole, thereby causing the rock-arm M to move inward and withdraw the stop *o* from under the lever K, and the latter will then fall till it strikes the stop-pin *u* below. This causes the pawl J to slide down over two or more of the teeth of the ratchet, according as the stop-pin is placed higher or lower in the holes *v v*. The next up movement of the lever will give a correspondingly long movement of the feed-rollers, and move the address strip along the width of the wide address. In this manner the cutting of addresses of varying widths is accomplished in an automatic manner. After the pin has fallen through the hole of the printed strip, and before the latter begins to feed forward, the end *s'* of spring *s* strikes the cam-face *r* on the edge of the rock-arm M and throws the latter outward, thereby raising the pin from the hole free of the paper and preventing tearing of the latter. The spring disengages at the top of the rock-arm and allows the pin *p* to fall back on the printed strip.

R is a guideway or socket below the platen, in which rests a follower, S, which moves up and down freely. The top of this follower is the bed upon which the papers are placed to be addressed.

T is a supplementary follower or head below the follower S, also moving freely in the socket, and having one or more springs, *y y*, interposed between it and the follower S.

V is a lever, pivoted at *e*, one end resting loosely under and supporting the head T, the other end projecting out beyond the follower, as shown in Fig. 3.

W is a rod or plunger which passes loosely through a pipe-bearing, *z*, its lower end resting upon the projecting end of lever V, and its upper end resting under and in line with the arm L, which is attached to the gate. At every downstroke of the gate the arm L will strike the rod W, depressing the same, and the latter, through the medium of lever V, will operate on head T and force the follower S up to meet the platen *d*. The follower resting on a spring will adapt itself to any thickness of papers or other articles to be addressed, from a single sheet up to a great number of them piled one on top of another, the spring action producing just enough pressure under all circumstances to receive the pasted slip upon the upper sheet.

Having thus described our invention, what we claim as new, and desire to secure by letters patent, is—

1. In an addressing-machine, the combination, with feeding-rollers, of a bar having a hole therein, over which the printed strip passes, a pin resting on the strip and above the hole, an elbow or shaft which supports the pin, and a rock-arm, to which the elbow is attached, the rock-arm being provided with a stop for arresting the fall of the pawl-lever, and with a cam-face for receiving rocking motion from the gate, the printed strip being also provided with holes which come in line with the pin, as herein set forth.

2. In an addressing-machine, the combination of the bar F, provided with hole *a*, the pin *p* resting above the hole, the elbow N, to which the pin is attached, the rock-arm M, provided with the stop *o* and cam-face *r*, and the spring *s*, provided with a head, *s'*, for acting against the rock-arm, as shown and described, and for the purpose specified.

3. In an addressing-machine, the combination of the bar F, provided with hole *a*, the pin *p*, the elbow N, the rock-arm M, provided with stop *o* and cam-face *r*, the lever K, the pawl J, and the ratchet-wheel I, attached to the shaft of one of the feed-rollers, as herein shown and described.

4. In an addressing-machine, the combination, with the
553 lever K, pawl J, ratchet I, reciprocating gate G, and rock-arm M, of the stop-pin *u*, adjustable higher and lower in holes *v v* of the guide *h*, as herein shown and described.

5. The combination, with the lever K, pawl J, ratchet I, reciprocating gate G, and rock-arm M, of the spring *t*, as shown and described, and for the purpose specified.

6. The combination of the follower S, the platen *d*, spring or springs *y*, head T, lever V, rod W, and vertical arm L, as shown and described, and for the purpose specified.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JNO. DENNIS, JR.
DELOS S. YORK.

Witnesses:
R. F. OSGOOD.
JOHN E. BEAN.

557 UNITED STATES PATENT OFFICE.

JOHN F. ZACHARIAS, of Leesburg, Virginia.

Letters Patent No. 67833, dated August 13, 1867.

Machine for Attaching Labels.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, J. F. Zacharias, of Leesburg, in the county of Loudon, and State of Virginia, have invented certain new and useful improvements in machinery or apparatus for attaching labels; and I do hereby declare the following to be a full, clear, and exact description of the same. reference being had to the accompanying drawings, in which—

(Here follows diagram marked p. 556.)

Figure 1 is an elevation of my improved machine with the side frame removed.

Figure 2 is a front view of the same, and

Figure 3 is a view of the front part of my machine looking from the under side.

Similar letters of reference indicate like parts in all the figures.

The nature of my invention consists in constructing an apparatus for attaching labels to newspapers, &c., which shall automatically cut the same from a printed roll and paste them to the pamphlet or other article, thus effecting a great saving in time and labor over other methods now in use.

To enable others to make and use my invention, I will now proceed to describe its construction and operation.

In the drawings A is the frame of the apparatus supported by legs B, and is grooved at its front end to receive the tongues on the sides of the sliding-gate C. This gate is provided with a handle, T, passing through the cross-piece of the frame A, and serves the purpose of depressing said sliding-gate, which, by means of a projection, S, upon it, engaging in the indentations *a* in the knife or cutter D, will force the same down, cutting off a slip from the paper roll: at the same time the lower part of movable or sliding-gate C will press it firmly against the article to which it is to be attached. E is a coiled spring for drawing up the gate C to its normal position. F is a projecting plate secured to the upper part of gate C by means of set-screws *b*. G is a lever hinged to the side frame of the apparatus, at *c*, and is kept pressed against the movable gate C by means of a spring, *d*. H is a swinging-plate, connected to the lever G by means of a rod, I. The plate H carries a pawl or pawls, *e*, which engage with the ratchet-teeth on the roller L, and are kept in position by springs *k*. K is a drum carrying the printed roll of paper *l*. From this drum the paper passes between the rollers L and M,

555 Zacharias Patent, No. 67,833. See Vol. I, page 223.

J. F. ZACHARIAS.

ATTACHING LABELS.

No. 67,833. Patented Aug. 13, 1867.

Fig. 1.

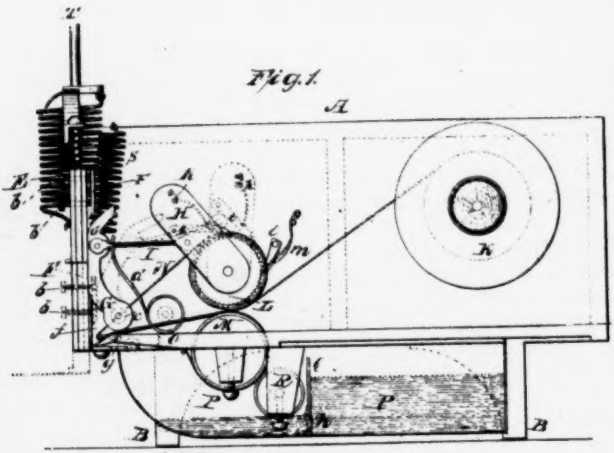


Fig. 2.

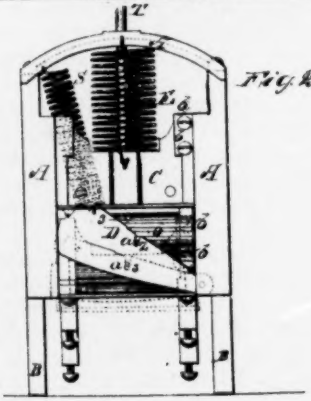
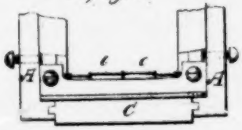


Fig. 3.



No. 13 Hoffman's Patent Bench, p. 556

where it is caught by the endless bands N O passing over the rollers L *f*, and M *g*, and thence carried to the cutter D. P is a reservoir containing mucilage, and is divided into two compartments by means of a partition, Q, the mucilage being fed from the rear to the front compartment through the valve or gates *h*, as may be required. R is a friction-roller which dips in the reservoir and delivers the mucilage to the endless band O, which in turn distributes it on the under side of the printed roll of paper as it is fed forward towards the cutter.

D is the knife or cutter, being indented on its upper side, and into which the protection on the sliding-gate C engages. S is a coiled spring which causes the cutter to resume its normal position when pressure is removed from the handle T. *e* and *m* are ratchets and springs for preventing the roller L from rotating in the wrong direction.

I will now describe the operation: One end of the roll of paper being inserted between the bands N and O, which pass over the rollers L *f* and M *g*, is fed forward to the knife or cutter in the following manner: The plate F on the sliding-gate C being set by means of the screws *b* to feed the required length of paper, the handle T is pressed down, and said plate striking against the lever G will force the same back, moving the plate H through the intermediary of the connecting-rod I, as shown in red lines in Fig. 1. The plate H in moving will rotate the roller L by means of the pawls *e*, and it in turn will rotate the roller M, causing the endless bands passing over these rollers to move and carry the printed paper forward towards the cutter. The endless band O being in frictional contact with the roller R, will cause it to revolve and distribute the mucilage over said band, which will deliver it to the under side of the printed roll of paper. When the paper shall have reached the extreme end of the machine the next depression of the handle will force out a length of the paper as shall have been previously determined, and the descending knife will cut the same from the roll, allowing it to drop upon the pamphlet or other article to which it is to be attached, and against which it is firmly pressed by the lower part of the movable gate.

Having thus described my invention, what I claim as new, and desire to secure by letters patent of the United States, is—

558 1. Knife D, provided with indenture *a*, in combination with the gate C, provided with the pin S, as and for the purpose set forth.

2. The adjustable projecting plate F, provided with set-screws *b b*, in combination with the lever G, link I, and swinging-plate H, as and for the purpose set forth.

3. The combination of rollers L and M, bands N and O, and supply-roller R, arranged and operating in the manner substantially as shown and described and for the purpose set forth.

J. F. ZACHARIAS.

Witnesses:
M. P. CALLAN.
WM. MARTIN.

561 UNITED STATES PATENT OFFICE.

C. B. SILL, of Wilkins, assignor to himself and John Goldsborough, of Philadelphia, Pennsylvania.

Letters Patent No. 84223, dated November 17, 1868.

Improvement in Instruments for Affixing Stamps.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, C. B. Sill, of Wilkins, in the county of Allegheny, and State of Pennsylvania, have invented a new and improved instrument for affixing revenue-stamps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

(Here follows diagram marked p. 560.)

Figure 1 is a vertical longitudinal section, taken in the line *x z*, Fig. 2.

Figure 2 is an end view of my invention.

Figure 3 is a detached view of a plate and springs for guiding the stamps.

Figure 4 is a detached side view of a ratchet-wheel device.

Figure 5 is a detached side view of the same, in connection with a pulley-device.

Figure 6 is a detached edge view of the pulley-device.

Similar letters of reference indicate like parts.

The object of this invention is the affixing of revenue-stamps upon receipts, checks, and all other papers requiring them, by means of a self-operating wetting and cutting-apparatus. It consists of a small reel or drum, on which a strip of stamps is wound, and passed to and over a wetted sponge, which moistens the gum on the stamp, to make it stick. The stamp is cut off by the action of the affixer, which is pressed down upon it, to attach it to the document placed under it.

A is a flat metal bed-plate, one end of which is made hollow, to form a box, B, in which is placed a sponge, *a*, that is fastened so that its upper surface shall be flat on the level of the top of the box, as shown in Fig. 1. The box B has its top higher than the top of the other end of the bed-plate A, and is provided with a sliding cover, *b*, covering it in part, and also a guide-plate, *c*, covering the other part, and provided with flat guide springs, c^1 c^2, between which the stamp passes over the sponge *a*, as shown in red in Fig. 1.

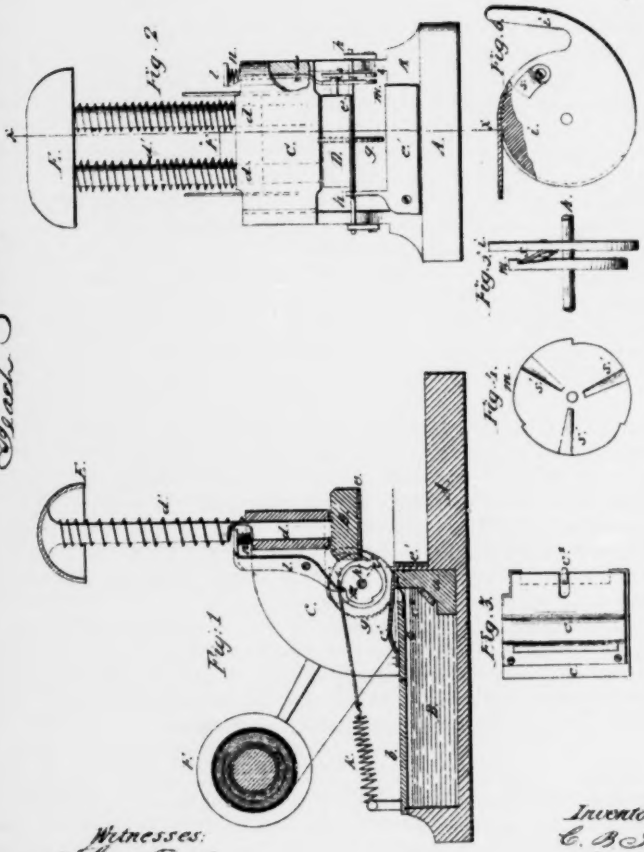
A standard-support, C, is set upon the inner end of the box B, extending from one side to the other, and projecting over the top of the bed-plate A for receiving the sliding stems *d d* of a stamp-press plate, D, attached to their lower ends.

On the upper ends of the sliding stems *d d* is a head, E, for pressing upon with the palm of the hand, to affix the stamps, and around

C. B. Sill,

Attaching Labels,

No. 84,223. Patented Nov. 17, 1868



Witnesses:
Chas. Tucker
J. A. Lewis

Inventor:
C. B. Sill
Per Munn & Co
Attorneys.

the stems are wound spiral springs, d' d', which raise the stem with the plate D after it has been pressed down upon a stamp.

A steel plate e, is set on the bottom of the press-plate D, and another plate, e', on the back of the box B, the edges of which plates come together, and cut off the stamps, passing through guide-springs c^1 c^2 when the press-plate D is pushed down to affix the stamp.

A reel or drum, F, is placed over the box B, for holding a strip of stamps, as shown in red, Fig. 1, from which drum the strip of stamps passes between the guide-springs c^1 c^2, to be moved forward by the operation of a feeding-apparatus, consisting of a feed-wheel, g, placed on the middle of a shaft, h, hung behind the stamp-press D, over the sponge a, the periphery of which wheel bears down on the strip of stamps, and moves one stamp forward under the press D, at every movement of said wheel.

On one end of the shaft h is set loosely an eccentric-pulley device, i, one side of which has a curved arm, i', projecting backward in such manner that when the stamp-press D is pushed down to affix a stamp, the arm i' catches against it, and is pushed down with it. This movement draws upon and expands a spiral spring, k, while the feed-wheel g does not turn, but is held firm by a dog, l, that catches in a ratchet-wheel, m, placed on the shaft h, by the side of the device, i. The dog l has a small spring, n, at one end, which holds it in place in the ratchet-wheel, but when the spring is closed, by pressing on the upper end of the dog, the ratchet-wheel is released, and, at the same moment, a little side spring-pawl, s, on the device i, catches in one of several notches, s', in the side of the ratchet-wheel m, and, as the device i is drawn up by the contraction of the spring k, the ratchet-wheel is thus turned around, carrying with it the shaft h and the feed-wheel g, the proper distance for moving one stamp forward under the press D.

Thus the operation of pushing down the press D, to affix a stamp, places the feeding-apparatus in position for moving forward another stamp, when wanted, by merely bearing upon the head of the dog l, and releasing it from the ratchet-wheel m, which is then actuated by the spiral spring k, to turn the feed-wheel g. Thus the descent of the affixer both cuts off a stamp and "sets" the feed-wheel, which remains in this condition until another stamp is required, when a pressure upon the pawl-arm l releases the feed-wheel, and the latter, under the influence of the spring k, feeds out another stamp, which, in its passage over the sponge, is properly moistened. A stroke upon the affixer-head E then severs and affixes the stamp, and also "sets" the feed-wheel ready for another occasion. Thus no stamp is fed forward over the moistened sponge until it is about to be used, in which respect the machine differs from others.

I claim as my invention, and desire to secure by letters patent—

The combination of the cutter and affixer D, sponge a, a spring-feed, and the within-described devices, or their equivalents, through the medium of which the spring-feed is "set" on the downward movement of the affixer, as and for the purpose described.

C. B. SILL.

Witnesses:
CHAS. V. BAUM.
GEORGE SILL.

565

UNITED STATES PATENT OFFICE.

LEWIS BAILEY, of Aurora, Illinois.

Improvement in Addressing-machines.

Specification forming part of Letters Patent No. 148,103, dated March 3, 1874; application filed September 20, 1873.

To all whom it may concern:

Be it known that I, Lewis Bailey, of Aurora, in the county of Kane and State of Illinois, have invented a new and improved addressing-machine, of which the following is a specification:

My invention consists of a little hand instrument in which a paper-roll, pasting-trough, pasting-rollers, and shears are combined and arranged so that the operator can turn the pasting-rollers and draw the printed strip of paper from which the slips are to be cut through the pasting apparatus to the shears by the thumb and finger, while the hand retains its hold on the handle of the shears, and then work the shears to cut off the slip when the strip has been fed along sufficiently, without releasing the feeding or turning apparatus, all in a manner calculated to greatly facilitate rapidity of action.

(Here follows diagram marked p. 564.)

Figure 1 is a side elevation of my improved machine. Fig. 2 is a front elevation. Fig. 3 is a longitudinal sectional elevation on an enlarged scale, the section being taken on the line *x* of Fig. 2; and Fig. 4 is a front view of the paste-roller and driving-wheels.

Similar letters of reference indicate corresponding parts.

A is the roll, on which the long strip of paper B, containing the addresses, is rolled, to be fed to the pasting apparatus and the cutter. Said roll is mounted on journals in brackets C, rising up from the rear end of a little plate or bed-piece, D, of any approved kind. In front of the paper-roll is the paste-box E, at the front end of which is a paste-roll, F, working in an opening, G, in the end of the box, said opening extending to the bottom of the box, and the roller being fitted so nicely and so revolving as to prevent the escape of the paste, except at the upper part of the opening, where there is a brush, H, to brush off any excess of what is needed, or brush it into the little cells *a*, grooves *b*, or other like depressions in the surface of the roller provided for receiving it, so as only to deliver the needed quantity to the paper. Above the paste-roller is a pressure-roller, I, borne down upon its surface by springs K, to press the paper which runs between the rollers onto roller F sufficiently to receive the paste. This roller is circumferentially grooved, as shown in Fig. 2, so that while exerting a sufficient pressure upon the address-ribbon for pressing it onto the paste-roller, it will bear upon the paper only at intervals apart to prevent it from receiving an excessive amount of paste. In front of the paste roller are guides L M, descending nearly to the bed-piece, and conducting the paper which runs between them down to the stationary cutter. The guide-plates serve to prevent the address-ribbon from being carried upward by the movable cutter or shear-blade, and they are, also,

16666

563 Bailey Patent, No. 148,103. See Vol. I, page 225.

L. BAILEY.

Addressing-Machines.

No. 148,103. Patented March 3, 1874.

Fig. 1.

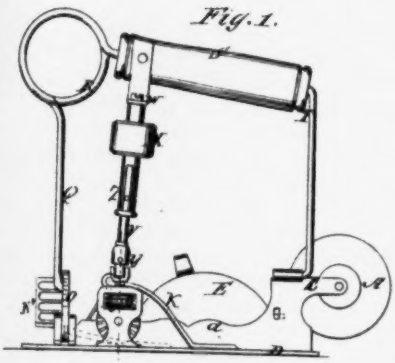


Fig. 2

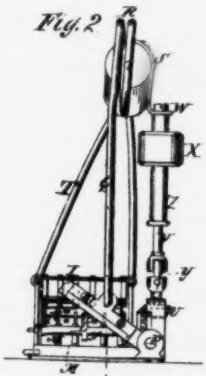


Fig. 3.

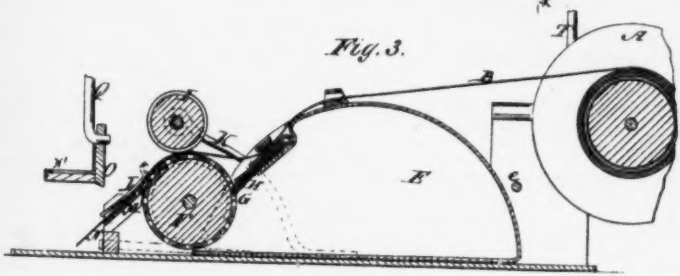
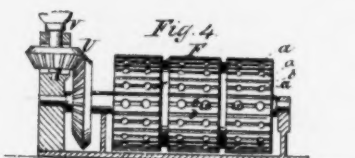


Fig. 4.



Witnesses:

E. Wolff
E. Bridgman

Inventor:

L. Bailey

Per Munn & Co

Attorneys.

both provided with tines or fingers *m*, which extend, respectively, over the paste-roller, and into the circumferential grooves of the same, so as to render it impossible for the address-ribbon to be carried or wound around the roller, to ear-pieces fixed on the front end of the bed piece, and it is connected by the rod Q and spring R with the front end of the handle S, which, at its rear end, is connected to the spring-standard T, rising up from the rear end of the platform, and so contrived that when, in the normal condition, it holds the shear-blade up, as represented in the drawings, to allow the strip of paper to be fed along under it; but when the handle is pressed down smartly, it will yield and let the shear-blade go down and cut off the paper strip. The spring R comes into action when the shear-blade is pressed down and strikes the bed to relieve the shock. It also presses the shear-blade against the stationary blade. To feed the paper along through the pasting-rollers and the cutter, the pasting-roller is geared by the wheels U with a little shaft V, extending up to a bearing-piece, W, attached to the handle near the front end. The shaft has a little milled wheel, X, just below the handle, where it can be worked by the thumb and forefinger of the hand that actuates the handle. Said shaft also has a universal joint at Y, to accommodate itself to the movements of the handle, and it also has a telescopic extension-joint at Z, to allow the milled wheel to rise and fall with the handle. The paste-box slides into its position against the paste-roller from the rear end between the sides *d*, and is held in position by a rod, *e*, which can be readily taken out when the paste-box requires filling. The paper-
566 roll A may be dispensed with, or any other equivalent contrivance may be substituted for it.

The pasting-rollers and feed mechanism may be used independently of the cutting devices for pasting long narrow strips that are not required to be cut.

Having thus described my invention, I claim as new and desire to secure by letters patent—

1. A machine for applying direction-slips to newspapers, &c., formed by the combination of a ribbon-reel, A, paste-receptacle E, clearing-brush H, recessed paste-distributing roller F, pressure-roller I, guide or guard plates L M, and movable cutter O, operating in concert with a stationary cutter, N, when the various parts are constructed and relatively combined in the manner herein shown and described.

2. The combination of the spring R with the rod Q, shear-blade O, stationary cutter-blade N, handle S, and supports T, substantially as specified.

3. The handle S, spring-support T, extension and jointed feed-shaft Z Y V, feed-wheel X, gear-wheels U, and paste-roller F, substantially as specified.

4. In combination with paste and pressure rollers F I, the guide-plates provided with guard-fingers or tines *m*, projecting over the paste-roller, as and for the purpose specified.

LEWIS BAILEY.

Witnesses:

T. B. MOSHER.

ALEX. F. ROBERTS.

571 UNITED STATES PATENT OFFICE.

HIVELL D. FARQUHARSON, of Boscobel, Wisconsin.

Improvement in Addressing-machines.

Specification forming part of Letters Patent No. 217,685, dated July 23, 1879; application filed June 4, 1879.

To all whom it may concern:

Be it known that I, Hivell D. Farquharson, of Boscobel, in the county of Grant, in the State of Wisconsin, have invented a new and useful improvement in addressing-machines, of which the following is a specification.

My invention relates to machinery for addressing newspapers, letters, and all printed or written matter to be sent through the mails, and is so constructed as to accomplish the running out of the paper coil containing the names and post office address, gumming, cutting, and stamping the same on the paper or mail-matter to be addressed, and automatically resetting itself for the next name and address, as aforesaid, all being done with one motion, as will hereinafter be more fully described, reference being had to the accompanying drawings, in which—

(Here follow diagrams marked pp. 568 & 570.)

Figure 1 is an elevation of the left side of my improved addresser. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is an elevation of the front portion of the right side of the same. Fig. 4 is a vertical transverse section of the same, cut through line *x x* of Fig. 2; and Fig. 5 is a rear elevation of milled pasting-roller with runways in vertical section.

The numeral 1 is a reel containing coil of paper, on which are printed or written names and post-office address of persons. 2 and 3 are guide-rolls for guiding paper to paste and friction rollers. 4 is a friction or feed roller milled or covered with cloth or other pliable material. 5 is a paste-roller milled and slotted to admit runways for carrying paper over lower knife, 6. 5* are the runways. 6 is the lower blade of knife. 7 is a stamp, to which one end of the upper blade of knife is attached by pivot working in a slot in the blade. 8 is the shank to the stamp, around which is wound a resetting coil-spring. 9 is a walking-beam, and may be attached to foot or any other motive power for operating said machine. 10 is a thumb-screw for regulating friction-spring 11. 11 is the friction-spring. 12 is a lever and ratchet, which is worked by bolt 13 in stamp 7, running in a slot, 19, in the right face of the machine. 13 is the bolt referred to. 13* is a stop which limits the sweep of the ratchet end of the lever 12 in such a manner as to hold the feeding mechanism in a state of rest until the stamp carrying

2 Sheets—Sheet 1.

H. D. FARQUHARSON.

Addressing-Machine.

No. 217,685. Patented July 22, 1879.

Fig 1.

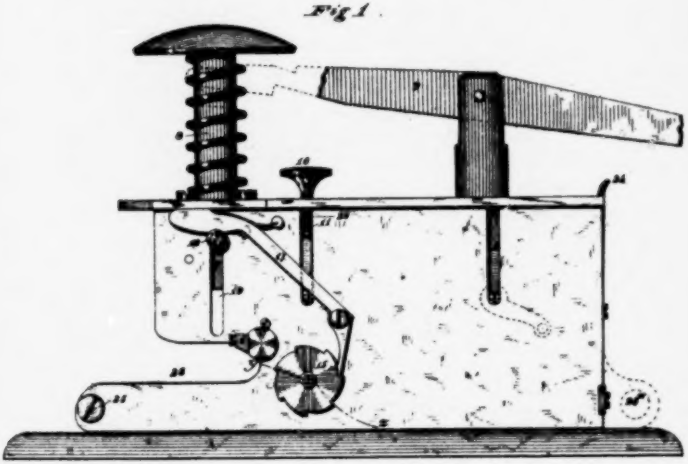
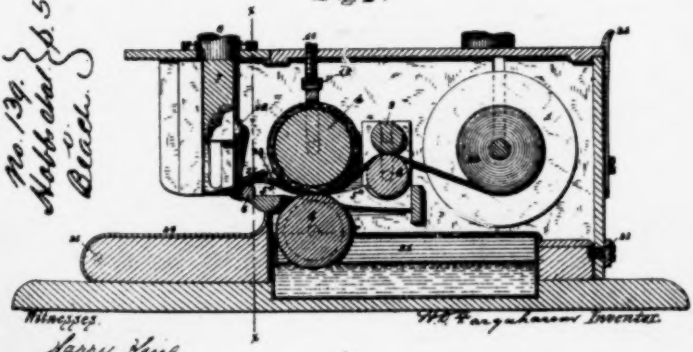


Fig 2.



No. 139. Hobbs et al. v. Beach. 568

Witnesses:
Harry King
Geo. Hazelton

H. D. Farquharson Inventor.

2 Sheets—Sheet 2.

H. D. FARQUHARSON.

Addressing-Machine.

No. 217,685. Patented July 22, 1879.

Fig 3.

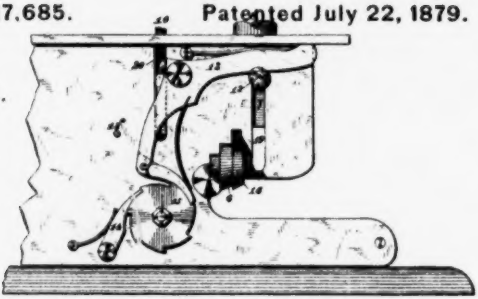


Fig 4.

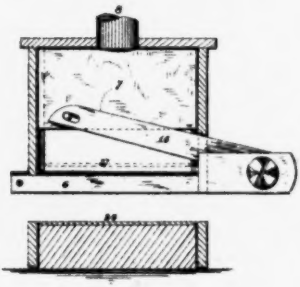


Fig 5.

Witnesses
Harry King
Geo. E. Haywood

H. D. Farquharson Inventor.

the knife has nearly completed its ascent. 14 is a dog which keeps the roll from running back. 15 are ratchet-wheels on paste roller. 16 is the upper blade of knife. 17 represents a check-dog, worked by bolt 18 in the stamp 7. 19 are slots in which bolts 13 and 18 work. 20 are slots in which the friction-spring standards rest. 21 is a covered paste-box provided with an aperture in its top, through which the paste is fed to roller 5. 22 is a paper strip containing addresses. 23 is a spring-latch for holding machine and base together. 24 is a spring-latch for holding the top of machine in place. 25 is a pivot-bolt upon which the machine is hinged in the front. 25* is a pivot-bolt upon which, as a substitute, the machine may be hinged in the rear. 26 is the mouth of the machine. 27 is an apron over the lower knife-blade, to prevent the paper from following the stamp on its upward motion.

The operation of my machine is as follows: Upon reel 1 is wound a paper strip containing names and post-office addresses, which paper strip passes between guide-rollers, then between friction and paste rollers, onto the runways to the knife. By placing the hand on the top of the stamp and forcing the same down, the knives cut off one name and address, and the same, being gummed or pasted on its lower surface, as hereinafter described, is affixed to the newspaper or other matter to be mailed, as such mail-matter is placed by hand in the mouth of the machine or fed through it by machinery. At the same time the ratchet, which is pivoted to lever 12, takes into the ratchet-wheel on the paste-roller, so that upon lifting the hand from the stamp the spiral spring forces the same back into position, the ratchet advancing the ratchet-wheel, gumming or pasting the paper strip, carrying it forward to the knife, and resetting the machine for a new operation. At the same time the check-dog 17 takes into the ratchet-wheel on the paste-roller on the opposite side of the machine to limit the motion of said roller.

572 The use of dog 14 is to hold the paste-roller while the ratchet is lifted by the downward motion of the stamp. The ratchet, dog, and check-dog are held to the work by a spring.

By means of thumb-screw 10 bearing upon tension-spring 11, the distance between the friction or feed roller 4 and paste-roller 5 is regulated and uniformity of speed secured. The box 21, having a top provided with an aperture in which the paste-roller revolves, may be supplied with paste, gum, or other adhesive substance; and in order to supply the same with gum or paste, press back spring 23, when the whole machine may be lifted from its base upon the front pivot, 25, fully exposing box 21.

In order to admit of free access to the paste-roller for the purpose of readily detaching the same from its bearings for cleansing, the frame can be pivoted at its rear end, as shown in dotted lines 25* in Fig. 1, and bisected in the plane represented by dotted lines *y z*.

The top of the machine is removable by releasing spring 24. A locking-shoulder is formed upon the front end of the detachable top, which rests under the rigid cross-head, through which the stamp-shank passes. This detachable top, in conjunction with the

slotted or open seats to the journals of the reel and friction and feed rollers, facilitates the removal of said reel and rollers.

For the purpose of placing the paper strip in proper position, and replenishing the same from time to time, remove the top, lift out the upper guide-roller, the tension-spring, and the friction or feed roller, pass the end of the paper strip between the apron and the lower knife, and attach the same to the reel; then replace these several parts and reel the paper strip by means of a small crank attached to the reel, and shown in dotted lines in Fig. 1. When said machine is used by hand the walking-beam 9 is detached. When using other motive power than the hand, the top of the stamp and the spiral spring should be taken off and the walking-beam attached, as shown by dotted lines in the drawings. To this walking-beam any motive power may be attached.

Paste-roller 5 is slotted or ground circumferentially about one-fourth of an inch from each end to about the depth of an eighth of an inch, though these grooves or slots may be deeper or shallower, or at other distance from the ends, without departing from the spirit of my invention. In these slots or grooves are placed runways 5*, made of sheet metal, which pass from a bar crossing the machine in front of the reel forward to and rest on the lower knife. The object of these runways is to carry the paper free from the knife.

The stamp is held up in its proper position by means of a spiral spring, which presses at its upper end against a knob on the shank 8, and at its lower end against the top of the machine.

I claim—

1. In an addressing-machine, the milled paste-roller 5, the yielding-surfaced feed-roller 4, and yielding adjustable spring-tension mechanism 10 and 11, all operating in the manner substantially as described.

2. In combination with stamp 7, provided with lugs 13 and 18, the spring-actuated ratchet-lever 12, ratchet-wheels 15 15, stop-dog 14, stop 13*, and check-ratchet lever 17, all constructed and arranged to operate as described, whereby a regular limited and fixed feed is imparted to the feeding mechanism, substantially as set forth.

3. In an addressing-machine, the detachable top, provided at its forward end with a locking-shoulder, and locked in position by spring-latch 24, operating at the rear, in combination with slotted journals cut in the sides of the frame, substantially as shown and described, whereby the various rollers forming the feeding mechanism are easily detached, as set forth.

4. In combination with the stamp 7, the reel 1, friction or feed roller 4, milled and slotted paste-roller 5, friction-spring 11, thumb-screw 10, knives 6 and 16, dog 14, lever and ratchet 12, check-dog 17, and ratchet-wheels 15, all operating substantially as and for the purposes described.

5. In combination with the stamp 7, the reel 1, guide-rollers 2 and 3, friction or feed roller 4, milled and slotted paste-roller 5, fric-

tion-spring 11, thumb-screw 10, knives 6 and 16, dog 14, lever and ratchet 12, check-dog 17, and ratchet-wheels, all operating substantially as and for the purposes described.

6. In an addressing-machine, substantially as described, the frame pivoted in the rear, and bisected in a plane which passes through the journals of the pasting-roller, in the manner and for the purpose set forth.

H. D. FARQUHARSON.

Witnesses:

HARRY KING.
JOHN B. FRY.

573 Date of application, 5th Apr., 1888. Specification accepted 25th May, 1888.

A. D. 1888, 5th April. No. 5073.

Complete Specification.

(Communicated from abroad by GUSTAV LUDWIG JAEGER, of New York, United States of America, manufacturer.)

A New or Improved Machine for Applying Fastening Strips to Boxes.

I, Alexander Henry Reed of Suffolk house, Laurence Pountney Hill, Cannon street, in the county of Middlesex, engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a machine for applying adhesive fastening strips to boxes, and it consists in a certain mechanism for intermittently feeding the strip directly between a punch and die, mechanism for cutting the same to any particular length to correspond with the depth of the box operated upon, means for applying the several strips to the box, and devices for turning inward and downward one end of the strip to secure the same to the inner surface of the sides of the box, all of which is fully pointed out in the following specification and claim, and illustrated in the accompanying drawing, in which

(Here follow diagrams marked pp. 579, 581 & 583.)

Fig. 1 represents a vertical section in the plane *x x* Fig. 2 of a machine embodying the invention.

Fig. 2 is a vertical front elevation of the same.

Fig. 3 is a sectional side elevation.

Fig. 4 is a perspective view of a box with the fastening strips applied.

Figs. 5 and 6 are perspective views of detail parts, said views being drawn to a larger scale than the preceding figures.

Figs. 7 and 8 are vertical sections illustrating the operation of the machine. These figures are also drawn on an enlarged scale.

Fig. 9 is a vertical section in the plane *y y*, Fig. 10 of a modified form of a machine, said figure being drawn on the same scale as figure 1.

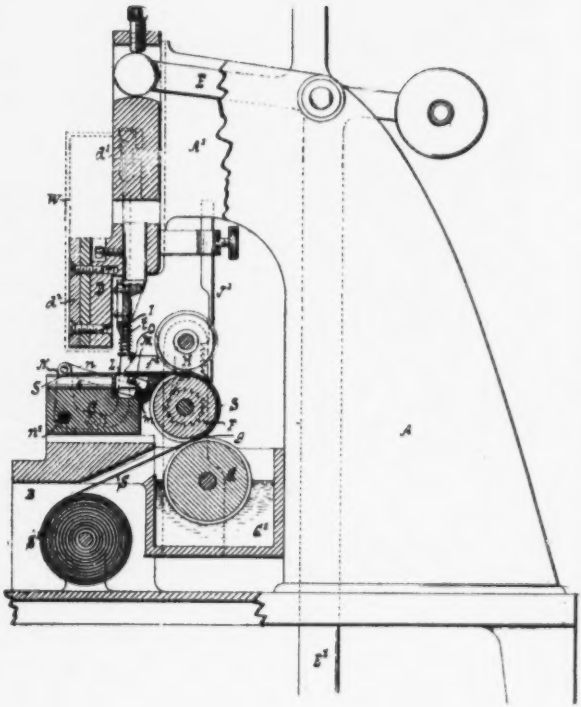
Fig. 10 is a vertical section in the plane *z z* Fig. 9.

Fig. 11 is a sectional elevation of part of the operating mechanism in a different position from that shown in Fig. 10.

Similar letters indicate corresponding parts.

574 In these drawings the letter A designates a frame suitably constructed to sustain the operating parts of the machine, and B is a table forming part of the frame, which table is

Fig. 1.



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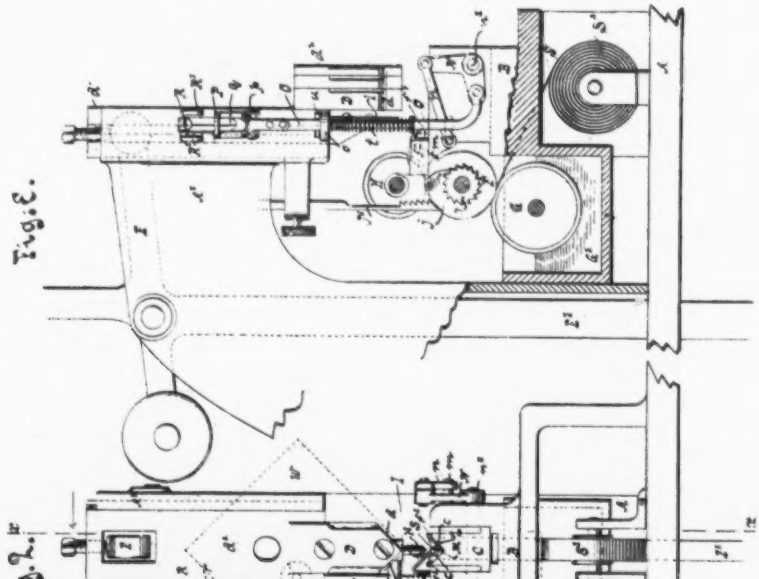

Fig. 1.

Fig. 2.

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Fig. 4.

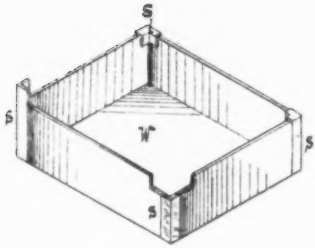


Fig. 5.

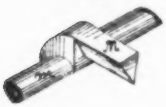
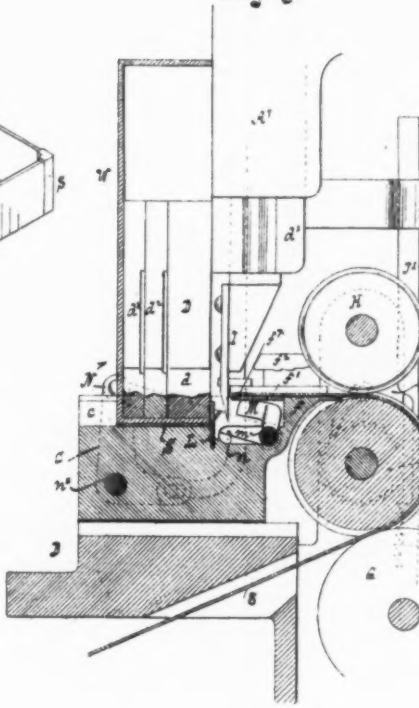


Fig. 6.

Fig. 7.



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SHEET 2.

Fig. 8

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Fig. 9.

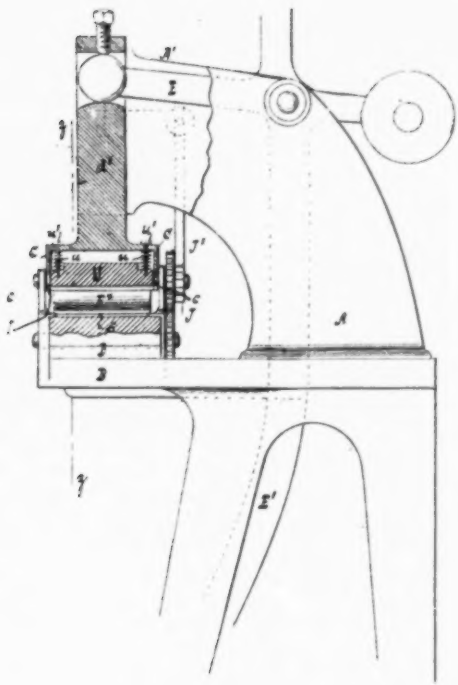

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Fig. 10.

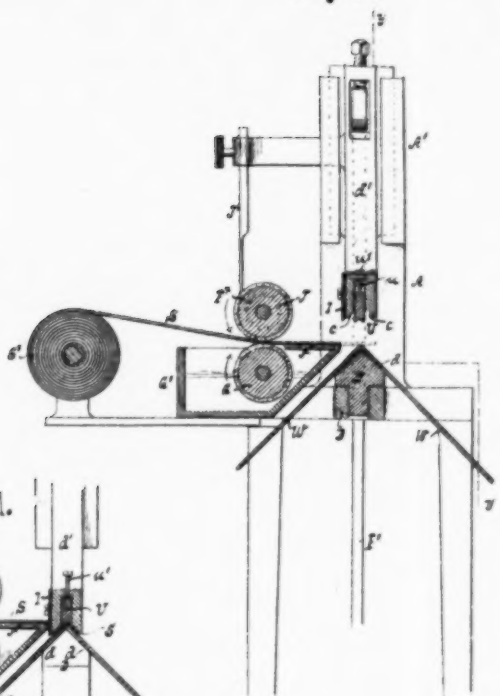
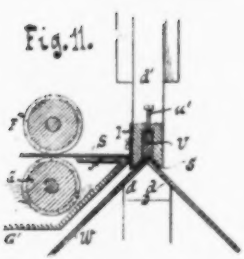


Fig. 11.



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properly made to receive and support a die C. The cheeks *c c* Fig. 2, of said die form an angle of 90° with each other to adapt the die for the reception of the corner of the box as W, Fig. 4, to which the fastening strips are to be applied. The punch D is located above the die and is provided with cheeks *d d*, Fig. 2, extending parallel with those of the die C. Said punch is moveable in the direction of its length, its shank d^1 being guided in vertical ways formed in an overhanging portion A^1 of the frame A, and it is moved toward and from the die C by any suitable mechanism, such for instance as shown in the drawing by a weighted bell-crank lever E E^1, Figs. 1, 2 and 3, which is pivoted to the frame and is vibrated by the foot of the operator.

It will be observed that the punch projects outwards from its shank, which permits the box W to be placed thereon in the proper position without interference, as best seen in Figs. 7 and 8.

The fastening strip S is fed directly between the punch and die by any suitable feeding device. In the example illustrated it is drawn from a roll S^1 best located directly beneath the table B by a feed roll F which rotates in contact with a combined feed and paste roll G, located within a paste fount G^1. The shafts of both rolls have suitable bearings in a standard *g*, Figs. 1, 2, 7 and 8, extending vertically from the paste fount. If the fastening strip has been previously supplied with a dry coating of mucilage, water is supplied to moisten the same by the paste roll G. The feed roll F is so located that the strip S passing from the same is on a level with the upper surface of the die C to which it is fed. The inner end of the die is prolonged (Figs. 1, 7 and 8) to form a flat support *f* for the fastening strip S, and suitable parallel guides as f^1 f^1 located on the upper surface of the die C are provided to keep the strip central with the die as it moves toward and over the same. A presser plate f^2 holds the fastening strip down upon the support *f*.

A creasing device such as a roll H having moderately keen edges, rotates above the feed roll F and engages with the fastening strip forming therein a continuous central depression or crease. This crease facilitates the bending of the strip and also acts to guide the paper into a correct position as the corner of the box comes into contact therewith. The cutter I which can be in the form of a keen edged knife or chisel is located in proximity to the rear of the punch and severs the fastening strip into definite and equal lengths.

It will be observed that the shafts of the creasing roll and the feed and paste rolls are connected by suitable gears as shown in Fig. 2.

To protect and securely fasten the upper free edges of the box, the fastening strip (see Fig 4) is usually carried over said edges and secured in the interior of the box. In view of this, the fastening strip must be cut into pieces somewhat longer than the depth of the box, and to this purpose the cutter I is set at the proper distance from the rear end of the punch.

A motion toward and from the fastening strip can be imparted to the cutter I by any suitable mechanism, but in the example shown

in the drawing the cutter is secured directly to the shank d^1 of the punch, such being the most convenient way of obtaining the requisite motion. The cutter passes directly in front of a sharp edge f^*, Fig. 8, of the support f, whereby the strip is severed. The usual devices for effecting the adjustment of the cutter with regard to the strip are provided. The cutter is best set to act slightly in advance of the punch D so as to sever the fastening strip before it is engaged by the latter, whereby the severed length is prevented from being crumpled.

To intermittently feed the fastening strip forward through the desired distance any suitable feeding device can be employed. In the example shewn in the drawing (see Fig. 3 especially) a ratchet wheel J is rigidly secured to the shaft of the feed roll F which ratchet wheel is in a position to be engaged by a toothed bar J^1 which is adjustably secured to the shank of the punch D and consequently moves with the same.

575 The bar J^1 may be hinged or provided with a thin portion as shown, so that it can yield on its descent to clear the teeth of the ratchet wheel J, which is held stationary during this stroke of the bar J by a pawl j pivoted to the standard g. In the upward stroke of the toothed bar J^1 the teeth thereof engage with the ratchet wheel to rotate the same, thereby actuating the feed roll F to move the fastening strip. On inspection of Fig. 7 it will be noticed that the punch D intersects the path of the fastening strip, and consequently the feed must be so timed that the strip will not come into contact with the same. This is accomplished by so setting the toothed bar J with respect to the ratchet wheel J^1 that it does not engage the same until the proper time (see Fig 8). To adapt the machine for boxes of any particular depth, plates d^2 are provided which can be secured by screws to the punch D so as to bring the top or free edge of the box always in the same vertical plane which is necessary to preserve equal lengths of the overlapped portions of the severed strips and also for the correct operation of the device which performs this overlapping. With varying depths of boxes, the feed must be varied correspondingly, which can be accomplished by adjusting the position of the toothed bar J^1 with respect to the ratchet wheel J. By setting the same lower, less teeth are caused to engage with the ratchet wheel and a smaller feed is the result, and *vice versa*. The adjustment of the feed can also be effected by using ratchet bars J^1 each having thereon a particular number of teeth to correspond to a particular length of feed desired.

To carry over and to lay the fastening strip in the corner of the box, devices as follows are employed. At the inner ends of the cheeks c c or in a position a trifle beyond the edge of the box, when the latter is in the die, is formed a ledge or projection L which extends outwardly from said cheeks and engages with the fastening strip S just beyond the edge of the box as the — descends in the die, whereby said strip is turned about the edge of the box to occupy a position approximating that shown in Fig. 7. This ledge or projection L, is hereafter termed the strip turner L. When the end of

the fastening strip is thus turned it is in a position in which it can be engaged by a folder M, Figs. 1, 2, 5, 7 and 8, on the subsequent withdrawal of the punch D. The folder completes the turning or bending of the strips and lays the bent-over portion upon the interior of the sides of the box. The folder is provided with two cheeks forming an angle of 90° with each other to correspond to the angles of the box. It is secured to a shaft *m* having bearings in a slot extending horizontally through the die and table. To the ends of said shaft *m* are rigidly attached links *n n* which connect said shaft with the vertical arms of crank levers N N that are secured to the opposite ends of a rock shaft n^1 having bearings in the table. The horizontal arm of one crank lever N has a pin and slot connection with a rod *o*, Figs. 2 and 3 especially, which extends upwardly and is vertically guided in a box *o* on the frame of the machine. To the upper end of the rod is hinged an arm P (see also Fig. 6) which is normally held in line with the rod by a spring *p* bearing upon the arm. In said arm P is a slot *q* which can receive a pin R secured to the shank d^1 of the punch D. This pin engaging the arm P at the upper end of the slot carries the same upward with it until a cam surface *r* (see Fig. 6 especially) on said arm engages with stationary cams R^1 R^1, Figs. 2 and 3, on the frame, whence the hinged arm is swung outward and clear from the pin. A retractor such as a spring *t* encompassing the rod O and confined between a shoulder on the same and the box *o* on the frame A immediately withdraws the rod O on its release from the pin. A stop *u* on the rod O engages with the box *o* and checks the falling motion of the rod.

During the rising motion of the rod, the folder M is carried forward toward the box W and at the same time gradually turned downward or oscillated with the shaft *m* whereby it is caused to engage the free end of the fastening strip S and to lay the same within the box as described (Fig. 8). During the fall of the rod O the folder is returned to its normal position Fig. 7.

The oscillating motion of the shaft *m* and consequently that of the folder M is the result of the change in inclination of the links *n n* during the vibration of the crank levers N, Fig. 7 and 8.
576 This oscillatory movement of the folder combined with its translatory movement causes the strip to be neatly and securely laid within the box.

The object of releasing the rod O which actuates the folder, before the return or downward stroke of the punch D, is to allow the folder to reach its normal position (Fig. 7) before the descent of the punch, as it will be seen from Fig. 8 that the folder operates during the upward stroke of the punch, *i. e.*, when the same is out of the path of said folder.

It is evident that other mechanism can be employed to successfully actuate the folder and consequently any other suitable mechanism may be used for that purpose.

To prevent the fastening strip from peeling off when the box is handled while in use, the outer face of the strip is caused to lie flush or a little below the faces of the box (see Fig. 4), so that they cannot catch into foreign bodies. This is done by making the cheeks *c c* of

the die C of approximately one-half the width of the strip and then causing the punch to descend with sufficient force to compress the material of the box and thus force the strip inward and flush with the sides of the box. The same can be done in the case of the overlapping portion of the strip by causing the folder to act with sufficient force.

Instead of feeding the fastening strip lengthwise between the die and the punch, it can be fed transversely between the same. This is preferable when the box is very deep, as the strip when fed lengthwise between the punch and die is liable to turn out of its course.

A machine embodying in its construction a device for feeding and fastening the strips transversely is illustrated in Figs. 9, 10, and 11. In this machine the die C is made moveable and the punch D is rigidly secured to the table B and forms an anvil or support for the box as before, said box being applied thereto as shewn in Figs. 10 and 11. The feeding device for propelling the strip directly between the punch and die is situated on one side of the punch and feeds a strip having a width corresponding to the required length or depth of the strip as applied to the box.

In the example shewn in the drawings, Figs. 9, 10 and 11, the feeding device consists of two feed rolls F and G, one of which is located in a paste or water fount G^1. The feed rolls are actuated from the reciprocating die by a ratchet wheel J and toothed bar J but may be driven by any other suitable means.

The strip S is fed over a support *f* which can be conveniently formed on the paste fount, and the inner side of which is parallel to and almost in line with a flat cutter I attached to the corresponding side of the die C. At the beginning of the downward stroke of the die C, the feed rolls F and G are actuated and feed the strip S between the punch and die that is over the corner of the interposed box W (see Fig. 10.) After the completion of the feed, the descending cutter I severs the strip. To additionally support the strip while being severed, and to hold it firmly upon the interposed box, use is made of a clamp U which is fitted loosely in a central longitudinal recess in the die and is subjected to the action of springs *a* which tend to force it outward from the die to the position shown in Figs. 9 and 10 in which position its motion is arrested by stops a^1 a^1 engaging the die. In the outer end of the clamp is a longitudinal groove corresponding to the corner of a box. As the die descends towards the box, the clamp U engages with the strip and holds it firmly while the strip is being severed by the cutter I; on the further movement of the die the clamp yields, until its outer end lies flush with the cheeks *c c* of the die (Fig. 11) In this position its inner end engages with the end of the recess and the clamp consequently forms an unyielding and operative portion of the die when said die is in engagement with the strip (Fig. 11).

Instead of having one long clamp several short clamps could be arranged in the length of the die to produce the same effect.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. The combination with a die having diverging cheeks, of
577 a punch having diverging faces corresponding to the die, said punch and die co operating to lay an adhesive fastening strip upon the corner of an interposed box, a feeding device substantially as described for feeding the strip directly between the die and punch, and a cutter for severing the strip into suitable lengths, substantially as described.

2. The combination with a die adapted to receive a box corner, a punch corresponding to the die, said die and punch co-operating to lay the fastening strip upon the corner of an interposed box, a feeding device substantially as described for feeding the strip directly between the punch and die, a cutter for severing the strips into suitable lengths, and a strip turner and folder located in proximity to the die for engaging with and laying the overlapping end of the fastening strip in the interior of the corner of the box, substantially as shown and described.

3. In a machine for applying fastening strips to boxes, the combination of a die having diverging cheeks, a punch corresponding to the die, a feeding device substantially as described, a creaser for creasing the strip throughout its length, and a cutter for severing the strip into suitable lengths, substantially as shown and described.

4. In a machine for applying fastening strips to boxes, the combination of a die having diverging cheeks, a punch corresponding to the die, a paste roll, a feed roll in contact with the paste roll, a creaser in contact with the feed roll and a cutter, substantially as shown and described.

5. The combination with a punch and die co-operating to lay the fastening strip upon the corner of an interposed box, of a cutter for severing the strip into suitable lengths, a feed roll a ratchet wheel on the arbor of said roll, and a yielding, adjustable rack bar carried by the punch or die and engaging with the ratchet wheel during its movement in one direction only, substantially as shown and described.

6. The combination with a punch of a die adapted to receive the corner of a box, said punch and die co-operating to lay the fastening strip on the box corner, a cutting and feeding device substantially as described, a strip turner and a folder having a translatory and an oscillatory movement across the path of the punch, substantially as shown and described.

7. The combination with a die having diverging cheeks of a punch having diverging faces corresponding to the die, said punch and die co-operating to lay the fastening strip upon the corner of an interposed box, a feeding device, substantially as described for feeding the strip directly between the punch and die, a moistening or pasting device and a cutter for severing the strip into suitable lengths, substantially as shown and described.

8. The combination with a punch and die of the folder M, the rod O connected with the folder, a hinged arm on said rod, a spring acting on the same, a cam as R^1 for tripping the hinged arm, a connection between the hinged arm and the punch, and a retractor acting on the rod O, substantially as shown and described.

9. The combination with a punch and die, of the folder M, the rod O connected therewith, a hinged arm on said rod, a spring acting on the arm, a cam as R^1 for tripping the hinged arm, a pin and slot connection of the arm with the punch, and a retractor acting on the rod O, substantially as shown and described.

10. The combination with the folder M, mounted on a transversely moveable shaft, of the crank levers N, links *n* connecting the shaft with the same, and a rising and falling rod O connected with one of the crank levers, substantially as shown and described.

11. The combination with a die and a punch co-operating to secure a fastening to the corner of a box, of means substantially as described for rendering the fastening adhesive, and mechanism for suitably feeding said fastening, substantially as described.

Dated this fifth day of April, 1888.

A. H. REED.

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593 UNITED STATES PATENT OFFICE.

MARK D. KNOWLTON, of Chicago, Illinois.

Box-jointing Machine.

Specification forming part of Letters Patent No. 447,955, dated March 10, 1891. Application filed February 14, 1888. Serial No. 263,998. (No model.) Patented in England April 5, 1888, No. 5080.

To all whom it may concern:

Be it known that I, MARK D. KNOWLTON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in box jointing machines, (patented in Great Britain on the 5th day of April, 1888, No. 5080;) and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved machine for making the joints in the manufacture of boxes or other articles of paper, straw-board, wood veneer, or similar material, and more particularly adapted for use in the manufacture of paper or straw-board boxes for the purpose of "setting up" or jointing the cut edges of the paper, straw-board, or wood-veneer box-blank at the corners of the box.

The invention relates more particularly to a machine organized for applying to the edges to be joined a strip or piece of paper or other material, which is caused to adhere to the parts by paste, glue, or other adhesive substance.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

A machine embodying my invention embraces as its main or essential features clamping-dies for pressing or forcing jointing-strips against or in contact with the edges of the parts to be joined after paste, glue, or other adhesive substance has been placed between the strip and the surfaces to which it is to be applied, together with means for guiding or directing to or between said dies a paper strip from which the individual jointing-strips are severed. As far as this main feature of the invention is concerned the paper strip may be fed forward to the dies either by hand or otherwise.

The machine herein shown embraces as a separate and further improvement an automatically-acting feeding device by which the paper strip is fed forward between the dies each time the latter are actuated for clamping the strip against the parts to be joined.

The particular machine herein shown embraces, furthermore, as an additional improvement an automatically-acting cutting device for severing the jointing strips or pieces from the continuous strip and for applying adhesive substance to said strip. The devices for applying adhesive substance are not essential in a machine em-

bracing the main features of construction above illustrated, inasmuch as the strips may be previously coated with adhesive substance, which is allowed to dry and is moistened by steam or otherwise shortly before it is applied to the parts to be joined, or paste or glue may be applied by hand to the jointing-strips or to the parts to be joined. The employment of means for continuously applying paste or glue to the strip as it is fed to the clamping-dies is for several reasons preferred, and a machine embracing devices for this purpose is herein claimed as new, as are certain parts of the machine relating to the paste-applying devices. The machine may be employed for joining the edges of paper or straw-board articles either when the parts to be joined are in the same plane or when they are arranged at an angle with each other.

The particular machine shown is for joining the sides of straw-board boxes, and the dies are therefore made one concave and the other convex and with flat faces arranged at an angle with each other.

In the machine herein illustrated one of the clamping-dies is constructed to reciprocate in applying the jointing strips, while the other remains immovable, and the paper strip is severed by a knife or cutter upon the machine-frame acting in conjunction with a cutting edge of or upon the movable die. In said machine, furthermore, the non-reciprocating die or anvil-block is bodily movable or adjustable with relation to the machine-frame and the stationary cutter supported thereon, and said non-reciprocating die or anvil-block is connected with the actuating devices by which the paper is fed forward in such manner that the extent of the forward movement of the paper strip will be changed by moving the said adjustable die to correspond with the width of the sides of the box to be joined by the strip, so that a jointing strip of the right length will in every instance be applied to the box.

594 The machine herein shown is furthermore adapted to be actuated by a foot-lever; but a machine embracing similar features of construction may be operated by power or by the operator acting through other means than the foot-lever.

The invention may be more readily understood by reference to the accompanying drawings, in which—

(Here follow diagrams marked pp. 586, 588, 590, & 592.)

Figure 1 is a plan view of a machine embodying one practical form of my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a front elevation thereof. Fig. 4 is a vertical section taken upon line 4 4 of Figs. 1 and 3. Fig. 5 is a horizontal section taken upon the line 5 5 of Fig. 2. Fig. 6 is a perspective view of the main parts of the paper-feeding devices removed from the machine. Fig. 7 is a detail perspective view showing some of the parts shown in Fig. 6 as viewed from below. Fig. 8 is a detail cross-section through the parts illustrated in Fig. 6, taken upon line 8 8 of Fig. 1. Fig. 9 is a perspective view of the sliding stationary die or anvil-block removed from the machine. Fig. 10 illustrates a stationary cutter

16678

585 Knowlton Patent, No. 447,955. See Vol. I, page 177.

(No Model.) 4 Sheets—Sheet 1.

M. D. KNOWLTON.

BOX JOINTING MACHINE.

No. 447,955. Patented Mar. 10, 1891.

Fig. 1.

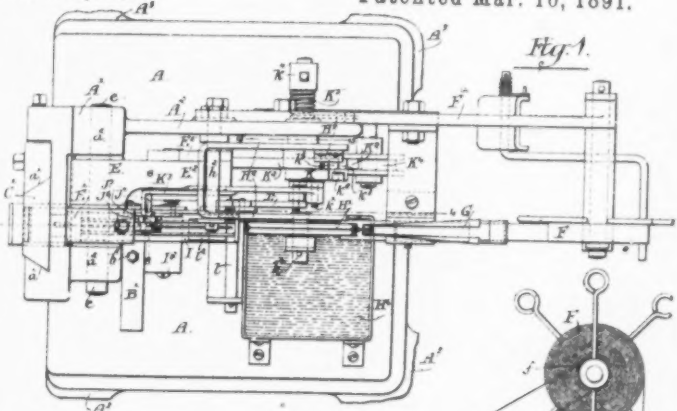
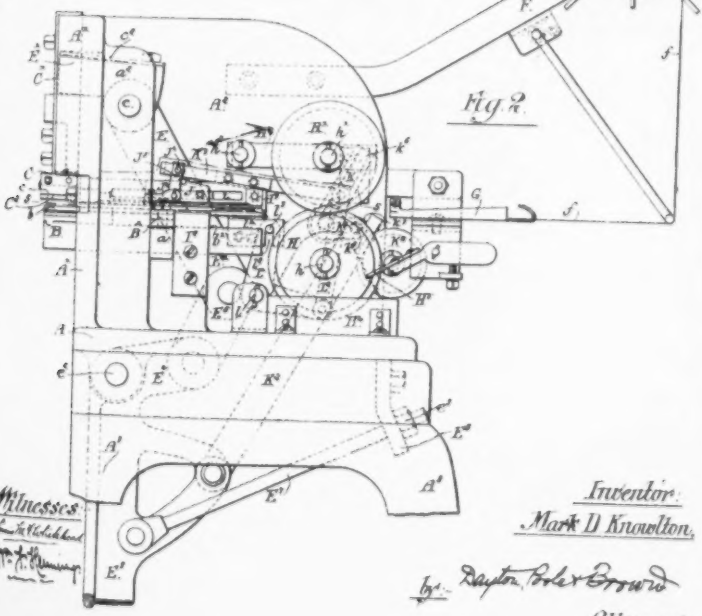


Fig. 2.



Witnesses.

Inventor.
Mark D Knowlton,
by Dayton Bros & Brown
Attorneys.

(No Model.) 4 Sheets—Sheet 2.

M. D. KNOWLTON.

BOX JOINTING MACHINE.

No. 447,955. Patented Mar. 10, 1891.

Fig. 10.

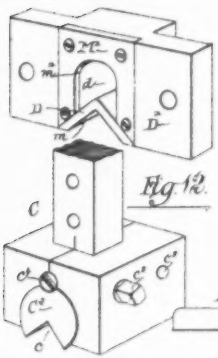


Fig. 3.

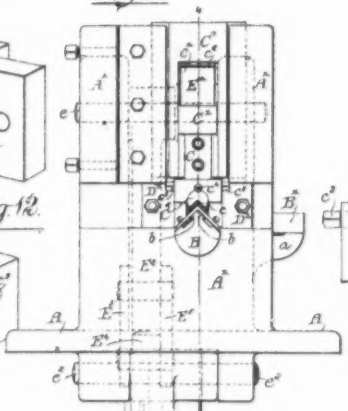


Fig. 11.

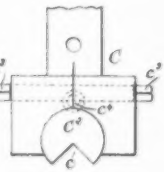
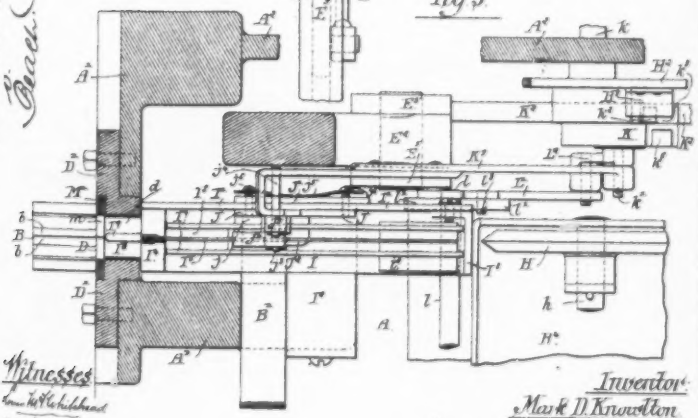


Fig. 12.

Fig. 5.



No. 139, Kobbe's Pat. No. 585, Exam.

Witnesses:
Wm. H. Whitehead
Wm. A. Fleming

Inventor:
Mark D. Knowlton
by Dayton, Bole & Brown
Attorneys

(No Model.) 4 Sheets—Sheet 3

M. D. KNOWLTON.

BOX JOINTING MACHINE.

No. 447,955. Patented Mar. 10, 1891.

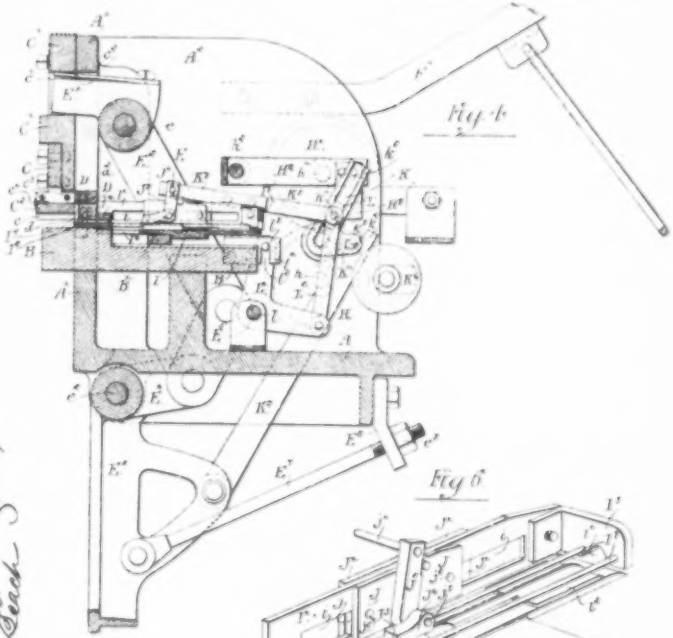


Fig 6

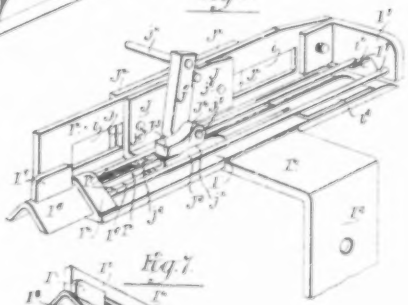


Fig 13

Fig 7

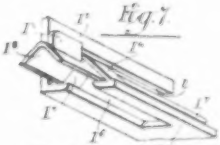
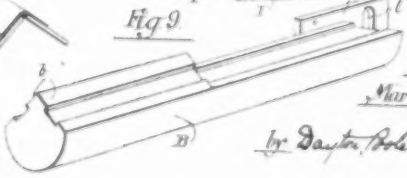


Fig 14

Fig 9



Witnesses

Invention

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(No Model.) 4 Sheets—Sheet 4.

M. D. KNOWLTON.

LOX JOINTING MACHINE.

No. 447,955. Patented Mar. 10, 1891.

Fig 8.

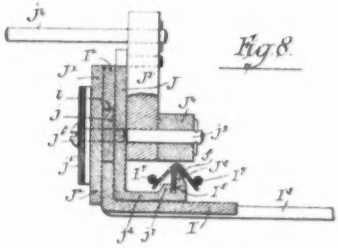

Fig 15.

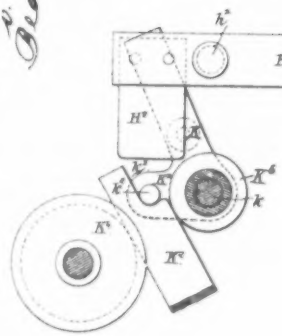

Fig 16.

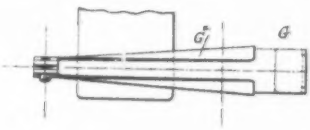

Fig 17.

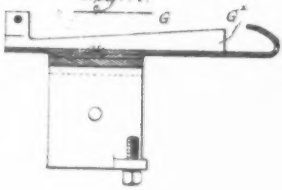

Fig 18.

Fig 19.

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and its supporting-plate detached from the machine. Fig. 11 is a rear elevation of the movable die and cutter. Fig. 12 is a perspective view of the same as seen from the front of the machine. Fig. 13 illustrates the cut and scored blank forming the box-body before the corners are joined. Fig. 14 shows the corners after the jointing-strip has been applied. Fig. 15 is a sectional view taken upon line 15 15 of Fig. 1. Fig. 16 is a plan view of the paper folder and creaser. Fig. 17 is a sectional view of the same. Figs. 18 and 19 are sectional views of the same.

As shown in the said drawings, the main frame of the machine is formed by an integral casting embracing a horizontal bed-plate A, a vertical part or standard A′ at one end of the bed-plate, and a flat vertical side plate or web A^2, arranged at one side of the bed-plate and connected at its margin with the standard A′. To the bed-plate A are attached legs A^3, by which the machine is supported. Upon the frame thus constructed the several operative parts of the machine are mounted or sustained.

B is a non-reciprocating die or stationary anvil-block having the form of a bar or rod arranged horizontally and supported in the standard A′ somewhat above the bed-plate A. The said anvil-block B extends at its end through the exterior vertical face of the frame-standard A′, and the projecting part forms the working-surface of the die or anvil. The said anvil-block B is fitted to slide longitudinally within its seat or bearing in the standard A′, so that its end portion may be extended a greater or less distance from the face of the said standard. In a simple and convenient construction of the anvil-block herein shown the latter is made semicircular upon its under face and provided at its outer end with flat working-faces *b b*, arranged at right angles with each other, with their meeting edges upward. The anvil-block may be held or clamped in place in any suitable manner, the means for clamping, as herein shown, consisting of a clamp-bar B′, resting at its outer end against a laterally-projecting arm *a* of the standard A′ and bearing at its inner end upon a flat surface *b′* at the top of the inner portion of the anvil-block. The clamp-bar B′ is held against and over the anvil-block by means of a set-screw b^2 passing through the clamp-bar and entering the arm *a* near the anvil-block.

C is a movable part or reciprocating die of the clamping or pressing device, said die being arranged vertically over the end of the anvil-block B, which projects from the face of the standard A′, and being provided with a V-shaped notch or recess *c* in its under surface, forming the working-face of the die to engage with the oblique surfaces *b b* of the anvil-block. The die C is attached to a vertically-movable slide C′, mounted in guides *a′ a′* upon the standard A′. Said reciprocating die acts, in conjunction with a stationary knife or cutter D, to sever the separate jointing-strips from the long or continuous strip fed to the machine. Said stationary knife or cutter is located over the stationary die-block in such position that the said strip is fed or guided over said die-block as the strip is advanced between the dies. The cutter is herein shown as held or supported in a removable plate D′, which plate is bolted to the frame-standard

A′, and is provided with an opening or passage *d*, through which the strip passes to the dies, as will hereinafter more fully appear.

The slide C′, which supports the die C, is in the machine illustrated moved vertically for actuating the movable die C by the following devices:

E is a heavy and strong bell-crank lever mounted upon a pivot *e*, which is inserted through lugs or bearing a^2 a^2, located at the upper end of the standard A′ and at the inner face thereof. The said bell-crank lever E is provided with a short horizontal arm E′, which engages a recess *c*′ in the upper part of the slide C′. Said arm E′ is herein shown as provided with a flat spring e^2, arranged to bear upwardly against the upper wall of the opening *c*′ to take up lost motion in the parts. Said bell-crank lever E is provided with a second arm E^2, which extends obliquely downward to a point near the bed-plate A.

E^3 is a foot-lever pivoted at its upper end to the machine-frame by means of a pivot-pin e^2, arranged near the lower end of the standard A′. To the upper end of said foot-lever is attached a rearwardly-extending rigid arm E^4, which is connected with the lower end of the lever-arm E^2 of the bell-crank lever by means of connecting plates E^5 E^5. When the lower end of the foot-lever E^3 is thrown backwardly, the lower end of the lever E^2 is thrown upwardly
595 and inwardly, and the slide C′ and upper die thereby depressed. When the foot-lever is thrown forward, on the contrary, the die is elevated. I have herein shown a bar E^7 attached to the foot-lever, sliding in a bracket E^8 upon the bed-plate A and provided with a head e^3, as employed to limit the forward motion of the foot-lever.

The continuous strip of paper to be fed to the machine for making the joints is mounted upon a reel F, sustained upon an arm F′, attached to the frame.

f in the drawings indicates the paper strip. G is a folder which acts upon said strip after the latter leaves the reel to double or crease the same in its middle, so that it will take and maintain a V shape at the time it is introduced between the clamping-dies.

H is a pasting-roller, the periphery of which is made of V shape to fit within the creased or folded lower surface of the strip, and H′ is a presser-roller for holding the strip in contact with the said pasting-roller.

The paper strip is carried forward or fed to the clamping-dies after leaving the pasting-roller by feeding devices acting to give an intermittent forward motion to the strip, whereby the end of the latter is carried rapidly or quickly forward between the clamping-dies and over the margin of the box sides placed over the stationary die and remains immovable while the dies are being brought together and the jointing-piece to be attached to the box is being severed from the continuous strip. The said feeding device in its main or essential features comprises a reciprocating gripper which engages and carries forward the paper strip in its forward movement and becomes released from the strip at the limit of its for-

ward movement, so as to move backwardly without producing any corresponding movement in the strip.

The particular feature of construction herein illustrated in the feeding device and means for guiding the paper strip to the same and from said feeding device to the clamping dies are as follows:

I, Figs. 1, 4, 5, 6, 7 and 8, is an L-shaped guide-plate upon which the main operative parts of the feeding device are sustained.

Said plate I is herein shown as provided with a vertical flange I′ at one of its edges, which flange is provided with a longitudinal guide-slot *i*, in which the reciprocating gripper is held and guided. Said guide-plate is also provided with an arm or bracket I^2, by which it is secured to the machine-frame. The main part of the guide-plate I is arranged beneath the path of the paper strip, so that the said strip passes longitudinally over said plate parallel with the guide-slot *i* thereof. The said gripping device comprises a sliding plate J, arranged vertically against the plate I′, and held in place by means of a plate J′, located at the opposite or exterior face of the said plate I′, and connected with the plate J through the slot *i*. A filling-piece *j* is desirably attached to the plate J within the said slot.

J^2 is the lower jaw of the gripping device, said jaw being arranged centrally beneath the path of the paper strip and provided with a sharp or narrow bearing-edge *j′* to engage the inner surface of the strip at the upper part or crease of the same. The said jaw J^2 of the gripper is connected with the lower edge of the sliding plate J by a horizontal arm or plate j^2, located adjacent to the plate I and with its upper surface a sufficient distance below the edge *j′* of the lower gripper to avoid coming in contact with the corner margin of the folded or V-shaped strip passing over it, Fig. 8. In the simple and convenient construction of these parts herein shown the plate J, the plate j^2, and the gripper-jaw J^2 are formed or bent from a single piece of metal.

J^3 is the upper or movable gripper-jaw, which is arranged above the lower jaw J^2 thereof and is made vertically movable, so that it may be either engaged with or lifted free from the said lower jaw. In the particular embodiment of the invention illustrated the movable gripper-jaw J^3 is formed by or upon the end of the horizontal lever J^4, which is mounted upon a pivot-pin j^3, affixed in the sliding plate J, said lever J^4 being arranged horizontally and its pivot j^3 being arranged to overhang the path of the paper strip. The working-face of the said gripper-jaw J^3 is herein shown as formed by a separate piece of hard metal serrated or roughened to more positively engage the strip.

J^5 is an arm for actuating the gripper-arm J^4, said arm J^5 being attached to and extended upwardly from the arm J^4 and having at its upper end a horizontal crank-pin j^4.

In a device embracing the general features of construction above set forth the reciprocating part or plate carrying the gripping-jaws and the jaws themselves may be moved by any suitable actuating devices. As a simple and desirable construction of the parts, however, they are herein shown as so constructed that the reciprocating

gripper-carrying plate J and the gripper are driven by actuating devices engaged with the upper end of the lever-arm J^5 alone. For this purpose I provide frictional engagement between the said plate J and its guide, tending to retard the movement of the plate, so that when pressure is applied to the upper end of the arm J^5 in a direction to carry the said upper end of the arm forward the gripper-arm J^4 will first be depressed, after which a continued forward pressure upon the upper end of the arm J^5 will carry the sliding plate and gripper-jaws bodily forward. Similarly when the pressure is applied to the upper end of the lever J^5 to move the same backwardly the jaws will first be opened, and the entire gripping device will then be moved bodily backward. Any one of a great number of well-known devices may be employed for producing frictional engagement between the plate J and the guide-plate I'. The device
596 for this purpose herein shown, Fig. 5, comprises a flat spring j^5, resting at its middle against the plate J', and two screws j^6, inserted through the ends of said spring and through smooth openings in the plate J' and having screw-threaded engagement with the plate J. The spring j^5 holds the plates J and J' in forcible contact with the opposite sides of the guide-plate I', and by turning the screws j^6 j^6 the pressure of the spring may be adjusted as found necessary or desirable.

Devices herein illustrated for actuating the feeding mechanism are made as follows: K is a rocking lever which is pivotally supported upon a shaft k, mounted in the flange or web A^2 of the machine-frame at a point near the rear end of the machine. Adjacent to its pivotal point the lever K is provided with a rigid arm K', with which arm is engaged a bar K^2, the opposite or lower end of which is pivoted to the foot-lever E^3. The rocking lever K is connected with the lever-arm J^5 of the feeding device by means of a connecting-rod K^3, engaged with a pivot k' upon the lever K, and with the pivot-pin j^4 of the said arm J^5. The upper end of the bar K^2 is not pivotally connected with the arm K' of the lever K, but said arm K' is provided with a stud k^2, which engages a notch k^3 in the upper end of the said arm, and said lever is held in position for the engagement of said notch with the said stud by means of a supporting surface or abutment upon the machine-frame, herein shown as formed by an anti-friction roller K^4. The lever K is held at the rearward limit of its movement by a suitably-applied spring, so that the forward movement only of the gripping device is given by the action of the bar K^2 and foot-lever, the rearward or return movement of the gripping device being afforded by said spring. In the particular construction herein shown in these parts the shaft k of the lever K is rigidly attached to the arm and extends through and has bearing in the frame plate or web A^2. The said shaft, furthermore, extends outside of the web A^2, and is provided at its outer end with a collar k^4, to which is attached one end of a spirally-coiled spring K^5, the opposite end of which is attached to the frame. Said spring tends to hold the rocking lever K normally at the rearward limit of its movement and acts to promptly return the gripping devices to the starting-point of the same after the bar K^2 has been drawn

downwardly or retracted. The stud k^2 of the arm K′ is so located with reference to the bar K^2, that said stud will swing forward out of the notch k^3 of said arm after the arm has been lifted a short distance, and when the lever K has been swung forward a sufficient distance to give the movement in the gripping devices necessary for properly feeding the paper strip the said bar K^2 may be held from being carried forward away from the roller K^4 by means of a roller K^6, mounted upon the shaft k, Fig. 15, or otherwise. After the notch k^3 of the bar K^2 is released from the stud k^2 the upward movement of the bar is continued as the foot-lever is thrust backward without producing any movement in the gripping devices until the clamping-dies have been brought together and the necessary pressure put upon the parts to be joined and the jointing-strip.

For applying jointing-strips in the making of boxes of different sizes it is obviously desirable that the distance to which the strip is fed forward past the cutting or severing devices at each advance movement of the feeding mechanism should be capable of variation in order that the length of the strip used upon the box may correspond with the depth of the same. In connection with the stationary die or anvil-block, which is movable bodily to afford a greater or less distance between the cutting-off mechanism and the end of the block, as hereinbefore described, I have provided a connecting mechanism between such movable anvil-block and the parts by which the feeding devices are actuated, whereby the movement of the block a certain distance will produce a corresponding change in the throw of the gripping-jaws, whereby the length of the strip fed forward at each reciprocation of the gripping-jaws will correspond approximately with the length of the exposed part of the anvil-block and the joint to be made.

Devices herein shown for the purpose above described are constructed as follows:

The pivot-pin k', which connects the rocking lever K with the connecting-rod K^3, instead of being immovably secured in the lever K, is adapted for longitudinal movement upon said lever. For this purpose the said pin is herein shown as mounted upon a sliding block L, engaged with a guide groove k^6 in the said lever.

L′ is a bell-crank lever, which is mounted upon a pivot l, located beneath the inner end of the anvil-block or bar B and provided with an upwardly-extending arm having engagement with the block and with a horizontal arm, the free end of which is connected with the said sliding block L by means of a connecting-rod L^2. The connection between the bell-crank lever L′ and the anvil-block B is herein shown as formed by means of a plate l', attached to the side of the said anvil-block and provided with a vertical groove l^2, which engages a pivot-pin l^3 in the upper end of the vertical arm of said bell-crank lever. When the said anvil-block connected with the pivot-pin k' of the lever K in the manner described is thrust outwardly, said pivot-pin will be carried or moved upwardly away from the shaft of the said rocking lever K, thereby giving a greater throw to the said pivot-pin and increasing the throw of the gripping devices. When, on the contrary, the anvil-block is moved inwardly,

the pivot k' is moved inwardly upon the rocking lever K, thereby decreasing the throw of said pin k' and giving a less move-
597 ment in the gripping devices and decreasing the distance through which the paper strip is fed forward at each action of the feeding mechanism.

The particular construction herein shown in the guide-plate I for guiding the paper strip f from the passing-roller to the gripping devices and from said gripping devices to the clamping-dies is as follows: At the rear end of the guide-plate I' is located a rigid plate I^3, arranged at right angles with said guide-plate and extending over the path of the paper strip. Said plate I^3 is provided in its lower edge with a V-shaped notch i' to engage the upper surface of the strip. Upon the end of the plate I opposite the said guide-plate I^3 is located a V-shaped guide-bar I^4, which also extends over the strip and engages the upper surface thereof. Along the upper surface of the plate I, at the central line of the paper strip, is located a longitudinal guide-strip I^5, consisting of a narrow strand or filament of metal, the upper margin of which is arranged in approximately the same horizontal plane as the upper end of the lower gripping-jaw J^2, and which is constructed to engage the under surface of the paper strip within the seam or crease thereof. The purpose of this said guide-strip is to hold the paper strip accurately in position with relation to the gripping devices, so that the crease in the paper strip will come exactly over the lower gripping-jaw, and thus prevent a distortion of the strip when the same is gripped between the jaws. The said strip I^5 is herein shown as supported by being attached to a plate i^2, which is secured to the plate I at the end of the latter at which the paper strip enters the guiding devices. At its opposite or forward end the guide-strip I^5 is unsupported, the plate I being cut away beneath the strip at this point, so as to form an opening or recess I^6, Figs. 4 and 7, within which the upper edge or corner of the working face of the anvil may enter when said anvil is thrust inwardly for operating upon shallow boxes or covers. The said guide-strip I^5 may, however, be sustained or held from lateral movement by engagement with the lower gripping-jaw J^2, at one side of which said strip passes. A preferred construction in these parts is illustrated in Fig. 8, in which the guide-strip is shown as beveled at one side only to give it a sharp or narrow edge, located at that face of the strip which is in contact with the gripping-jaw, while the said jaw has a similar shape, being made flat at its side in contact with the guide-strip and beveled at its opposite or outer side. By this construction the upper edges of both the strip and gripping-jaw may be made to engage the crease of the paper strip, while at the same time the said gripping-jaw may be reciprocated without interfering with the guide-strip. If found necessary or desirable, a small lug or projection j^7, Fig. 8, may be placed upon the arm j^2 in position to engage the inner face of the guide-strip I^5, thereby forming with the jaw J^2 a notch in which the said guide-strip is held and guided. The said notch will, however, be made slightly deeper than the width of the guide-strip, so that the upper gripping-jaw will act

against the lower jaw J^2 without thrusting said guide-strip downwardly against the bottom of said notch.

I^7 I^7 are two guide-rods, which are located above the guide-plate I, one at each side of the guide-strip I^5, at such distance apart as to engage the upper surface of the paper strip near the lateral margins thereof. Said guide-rods aid in keeping the strip accurately in position with relation to the gripping-jaws of the feeding mechanism and are also of use to prevent the sides of the folded or creased paper strip from bending or curling up on account of the moisture in the paste or glue applied thereto. The said guide-bars I^7 I^7 may be attached to or supported from the plate I in any desired manner. As herein illustrated, they are inserted and secured to their ends in the guide-plate I^3 and guide-bar I^4. At its end nearest the clamping-dies the plate I is herein shown as provided with a V-shaped extension I^8, adapted to enter the opening *d* of the plate D′, by which the stationary cutter D is directly supported. Said plate I^8 serves to guide the paper strip until the latter reaches the said cutter. The projection I^8 is herein shown as provided at its top with a vertical flange I^9, the upper edge of which rests against the top of the said opening *d*. The sides of the said projection I^8, together with the flange I^9, serve to hold the ends of the guide devices accurately in position with reference to the knife and the clamping-dies by their engagement with the walls of said opening *d*.

I have found that in the use of rollers H H′, such as are herein shown, for applying paste to the paper strip, when the said strip is carried or moved rapidly forward by the action of the feeding mechanism described the impetus acquired by the paste-rollers as they are turned by the paper is liable to cause the said rollers to continue to turn in a manner to thrust the paper forward after the gripping-jaws have completed their forward movement. To avoid this result, I so construct the upper roller H′ that it may be lifted to free it from the lower roller H, and I provide means whereby the upper roller will be automatically lifted free from the lower roller at the moment the forward movement of the gripping-jaws is terminated. When the parts are thus constructed, the paper strip is released from the paste-rollers before the latter have an opportunity to act upon the strip in a manner to carry it forward. For the general purposes above set forth the upper feed-roller may be lifted or moved by any upwardly-moving part of the machine acting against the feed-roller support at the proper time. In one practical embodiment of this part of the invention herein illustrated these parts are made as follows: The upper roller H′ is mounted upon a
598 pivot-pin *h*′, secured upon one of two parallel arms H^2 H^2, which are rigidly connected with each other and are mounted upon a rigid pivot-pin h^5, affixed in the frame-plate A^2. Upon the end of one of the arms H^2 is formed or attached an arm or striker H^3, located in position to engage the stud k^2 of the rocking lever K when the said stud has nearly reached the upward limit of its movement. When the said lever K is actuated by the notched bar K^2, therefore, the arms H^2 H^2 and the roller H′ will be lifted at the moment the feeding device reaches the forward limit of its move-

ment and said roller H′ will be supported free from the paper strip until the foot-lever is swung rearwardly and the bar K^2 retracted preparatory to another and succeeding operation of the machine. The lower paste-roller H is constructed to enter a tank or receptacle H^4, containing paste or other adhesive substance, so as to become coated upon its margin in a manner heretofore common and well understood. H^5 is a scraper arranged to fit against the V-shaped periphery of the said feed-roller to remove the surplus adhesive substance therefrom.

The cutter or shear-blade D, employed to sever that part of the jointing-strip applied to the box-walls from the main or continuous part of the strip in the manner hereinbefore stated, acts in the particular construction illustrated in connection with the cutting edge formed at the rear surface of the movable clamping-die C as the movable die descends toward the work. Any separate knife or cutter on the movable die is rendered unnecessary in the particular construction shown by making the rear face and working-surface of the movable die of hardened steel.

The stationary knife or cutter D is herein shown as made preferably of thin or sheet metal and of inverted-V shape, said cutter being secured to the plate D′ by screws, the heads of which are shown. A plate M′, secured to the plate D′ above said cutter, aids in holding the same in place. Said plate M′ is provided with an opening m', Fig. 10, through which the strip passes over the knife. The forward or advance edge of the cutter forms the cutting edge thereof, and the said cutter is held up to its work by screws placed behind it or otherwise.

The movable die C may be constructed in any suitable or preferred manner to afford a suitable cutting-edge at its rear surface. In the particular construction herein illustrated the working-surface of the die is formed in a cylindrical block C^2 of hardened steel, the lower surface of which block is provided with a V-shaped notch corresponding in form with the opposing surface of the die-block B. The rear or inner end surface of the said hardened block moves in contact with the face of the cutter D, so that the edges of the notch act, in connection with the said cutter, to sever the paper strip. I have herein shown the block C as held within the head of the die by splitting the latter vertically and inserting one or more clamp-screws c^3 for holding the split parts together. A screw c^4, inserted in the head and overlapping the die-block C, serves to hold the guide-block from being thrust endwise out of the head and to adjust said block with reference to the stationary cutter.

In Fig. 13 is shown the cut and scored corner of a box-blank before the jointing-strip is applied to the same, and in Fig. 14 is shown the finished corner after the jointing-strip has been applied. In the operation of the machine the operator sits or stands in front of the same and places the corners of the box-blank, split and scored, as shown in Fig. 13, upon the upper surface of the anvil B below the movable die, the sides of the box being bent or held approximately at right angles with the bottom when the blank is placed upon the anvil-block. When the corner of the blank is thus held

upon the block, the foot-lever E^3 is actuated, with the result of quickly thrusting forward the end of the strip over the edges of the blank and then depressing the upper die to sever the strip and forcing it into contact with the surface of the blank. The folder G herein shown comprises a curved plate G', which is bent into U form, with its side walls arranged at some distance apart at their rear ends, but brought together or parallel with each other at their forward ends, so as to gradually bring together the margins of the strip, thereby bending the paper strip into U shape and to then fold or crease the strip as it emerges from the folder.

It will of course be understood that a previously-prepared gummed strip may be employed in the machine shown, in which case the pasting or gluing device shown will be used merely to apply water to the strip for moistening the gum or glue thereon. Obviously means other than the particular gluing or pasting devices shown may be employed, either for applying paste or glue to the strip or for applying water to a previously gummed or pasted strip, without departure from my invention.

The machine herein shown illustrates one practical embodiment of the main features of my invention, which latter may obviously be carried out in a machine differing in its details of construction from the particular one herein shown. One of the main features of the invention is embodied in a construction embracing a clamping device and means for creasing or folding the strip before it is fed to the clamping device; and as far as this part of the invention is concerned the said clamping and folding devices may be made otherwise than in the particular manner shown, and other features of the machine illustrated may be omitted without departure from my invention—as, for instance, the paste or glue may be applied by hand instead of automatically by the machine, or the ad-
599 justing devices for the lower clamping die or anvil may be absent.

Another important feature of construction herein illustrated embraces the connection between the movable or adjustable anvil-block and the actuating devices by which the feed devices are operated, whereby the length of paper fed forward at each motion of the machine may be varied to correspond with the depth of the box to cover, and as far as this feature of the invention is concerned the gripping devices may be made otherwise than in the particular manner illustrated, and the connection between the movable die-block and the said actuating devices may be made otherwise than as shown. The particular machine illustrated, however, contains many novel details of construction, which in themselves are made the subjects of specific claims herein.

I claim as my invention—

1. The combination, with clamping-dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening-strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, substantially as described.

2. The combination, with clamping-dies having flat faces arranged

at an angle with each other, said dies co-operating to press an adhesive fastening-strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, and a feeding mechanism for the strip, substantially as described.

3. The combination, with clamping-dies having flat faces arranged at an angle with each other, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, a paste or glue applying device for rendering the strip adhesive, and a feeding mechanism for the strip, substantially as described.

4. The combination, with clamping-dies having flat faces arranged at an angle with each other, of a folder or creasing device operating to fold or crease longitudinally a continuous jointing-strip, a paste or glue applying device for rendering the strip adhesive, a feeding mechanism for the strip, and a cutting device for severing the strip, substantially as described.

5. The combination of an anvil-block and an opposing movable die, said anvil-block and die co-operating to press an adhesive jointing-strip upon the corner of an interposed box, and said anvil-block being bodily movable on the machine-frame, a cutting device for severing the strip into suitable lengths, a feeding mechanism for the strip, embracing an adjusting device by which the movement or throw of the feeding devices may be changed, and an operative connection between the movable anvil and the said adjusting device by which the adjusting device is controlled by the shifting of the anvil, substantially as described.

6. The combination, with clamping-dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening-strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, and cutters for severing the strip, having angular cutting edges, substantially as described.

7. The combination, with clamping-dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening-strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, and a stationary knife or cutter having angular cutting-edges, that one of said dies which is movable being provided at the ends of its working-faces with cutting-edges acting in connection with the cutting edges on the said stationary knife or cutter, substantially as described.

8. The combination, with clamping-dies having flat faces arranged at an angle with each other, said dies co-operating to press an adhesive fastening-strip upon the corner of an interposed box, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, a cutting device for severing the strip, having angular cutting-edges, and a paste or glue applying device for rendering the strip adhesive, substantially as described.

9. The combination, with clamping-dies, of a feeding device embracing a reciprocating carrier and gripping-jaws mounted thereon and adapted to engage the said jointing-strip, and a paste or glue

applying device for rendering the strip adhesive, substantially as described.

10. The combination, with clamping dies, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, a feeding device embracing a reciprocating carrier and gripping-jaws thereon, one of which jaws is provided with a narrow edge engaging longitudinally the crease or fold of the strip, and a paste or glue applying device for rendering the strip adhesive, substantially as described.

11. The combination, with clamping-dies, of a folder or creasing device operating to fold or crease longitudinally a jointing-strip, a feeding device embracing a longitudinally-arranged guide-strip having a narrow edge engaging a crease or fold of the jointing-strip, a reciprocating carrier and gripping-jaws mounted on the carrier, one of said jaws being provided with a narrow edge arranged longitudinally of the jointing-strip and engaging the crease or fold of the same, and a paste or glue applying device for rendering the strip adhesive, substantially as described.

12. The combination, with an anvil-block or die adjustably supported upon the machine-frame, an opposing movable die, and a stationary knife or cutter acting, in connection with a cutting-edge, upon the movable die, of a reciprocating feeding device embracing a carriage and gripping-jaws mounted thereon, and means for giving reciprocating motion to said feeding device, embracing a rocking lever, means for actuating the same, a connecting-rod, a pivot or stud, said pivot or stud being movable longitudinally upon the rocking lever, and operative connections, substantially as described, between the said die-block and the said pivot pin or stud, whereby the stud is moved toward or from the pivot of the lever when the anvil-block is shifted.

13. The combination with an anvil-block or die adjustably supported upon the machine-frame, an opposing movable die, and a stationary knife or cutter acting, in connection with a cutting-edge, upon the movable die, of a reciprocating feeding device embracing a carriage and gripping-jaws mounted thereon, and means for giving reciprocatory motion to said feeding device, embracing a rocking lever, means for actuating the same, a connecting-rod, a pivot or stud upon the said rocking lever engaging the connecting-rod, said pivot or stud being movable longitudinally upon the rocking lever, and operative connection between the said adjustable die-block and the said pivot pin or stud, embracing a bell-crank lever connected with the anvil-block and a connecting rod or bar connected with said lever and stud.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

MARK D. KNOWLTON.

Witnesses:

M. E. DAYTON.

TAYLOR E. BROWN.

607 UNITED STATES PATENT OFFICE.

FRED H. BEACH, of Rochester, New York.

Machine for Attaching Stays to the Corners of Boxes.

Specification forming part of Reissued Letters Patent No. 11167, dated May 26, 1891. Original No. 447,225, dated February 24, 1891. Application for reissue filed April 9, 1891. Serial No. 388,344.

To all whom it may concern:

Be it known that I, Fred H. Beach, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful improvement in machines for attaching stays to the corners of boxes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

It has been customary heretofore in making paper or straw-board boxes to apply a stay or fastening strip over the joints at the corners of the boxes, which strip is pasted down on the outside of the box or is folded over the edge of the box and secured by paste both outside and inside of the corner, and such work, as far as I am aware, has heretofore been done by hand.

My invention relates to a machine for doing this work; and it consists in the matters hereinafter set forth, and pointed out in the appended claims.

(Here follow diagrams marked pp. 602, 604, & 606.)

In the accompanying drawings, illustrating my invention, figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a front elevation of the same in a plane at right angles to Fig. 1. Fig. 3 is a vertical cross-section taken upon line 3 3 of Fig. 2. Fig. 4 is a perspective view of the lower end of the upper die or plunger and the secondary or turning-in plunger of the machine. Fig. 5 is a perspective view of the two plungers when placed together, showing the entire length of the same as seen from the rear side thereof. Fig. 6 is a perspective view of the front end of the lower die. Fig. 7 is a detail side elevation of the shears or cutters by which the strip is severed. Figs. 8 and 9 are sectional views showing the opposing clamping-dies, illustrating the process of applying the stay to the corner of the box. Fig. 10 is a sectional view of one corner of the complete box, taken on a plane parallel with the bottom of the box. Fig. 11 is a vertical section of parts of the machine, taken upon line 11 11 of Fig. 2. Fig. 12 is a plan section taken upon line 12 12 of Figs. 2 and 11. Fig. 13 is a vertical section taken upon line 13 13 of Fig. 12, looking in the direction of the arrows in said figure. Fig. 14 is a detail section taken upon the line 14 14 of

601 Complainant's Exhibit Beach Reissue Patent, No. 11,167.

Patent in suit.

Put in evidence, Vol. I, page 14.

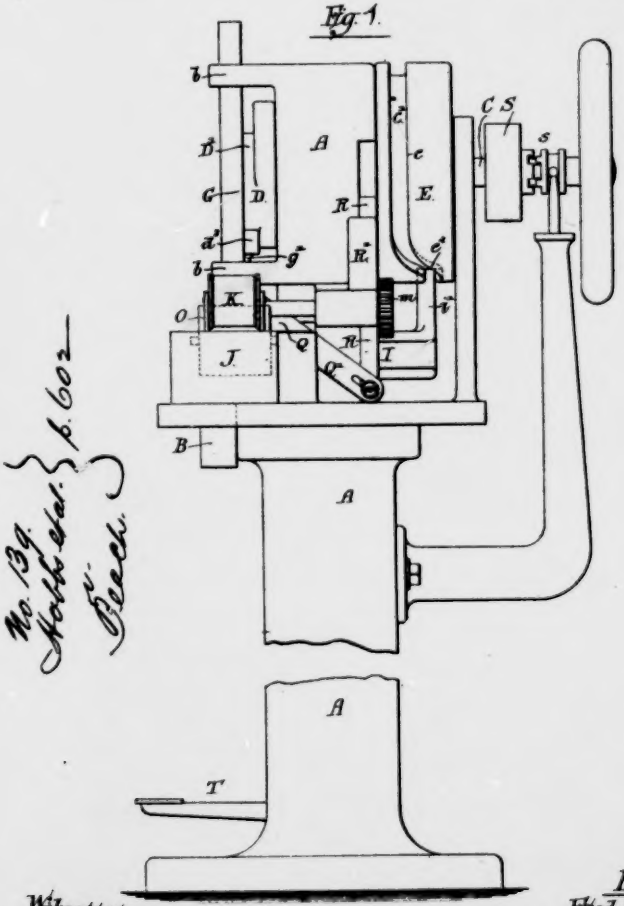
3 Sheets—Sheet 1.

F. H. BEACH.

MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES.

No. 11,167. Reissued May 26, 1891.

Fig. 1.



No. 139. Hobbler. } 6.602
Beach.

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George H. Huppin Jr.

Inventor:-
Fred H. Beach.

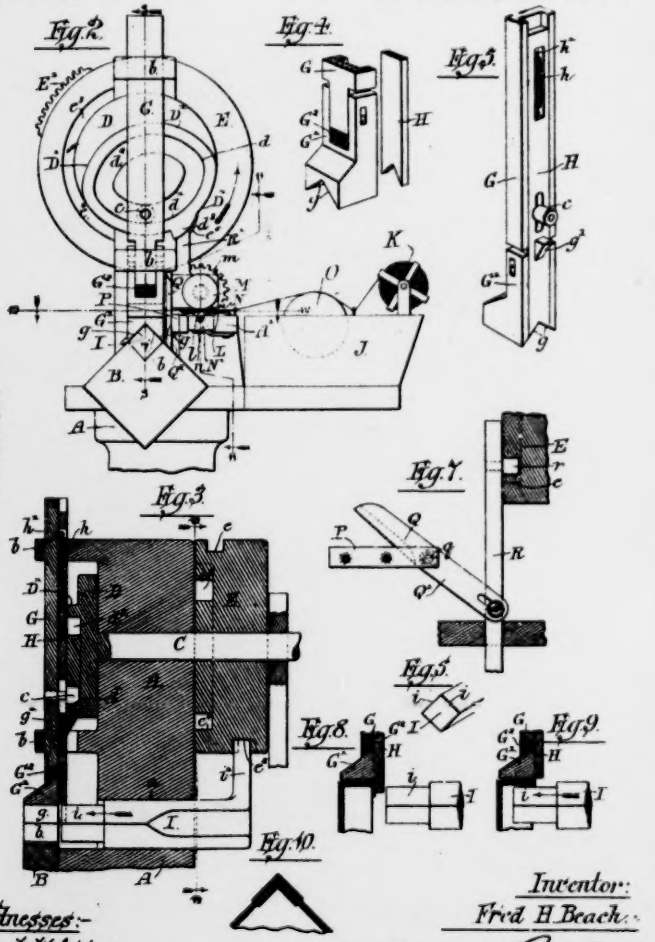
by:- Dayton, Poole & Brown
his Attorneys.

3 Sheets—Sheet 2.

F. H. BEACH.

MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES.

No. 11,167. Reissued May 26, 1891.



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F. H. BEACH.

MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES.

No. 11,167. Reissued May 26, 1891.

Fig. 11.

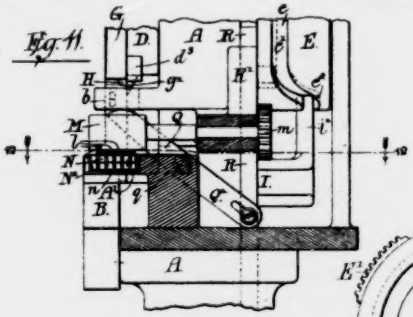


Fig. 14.

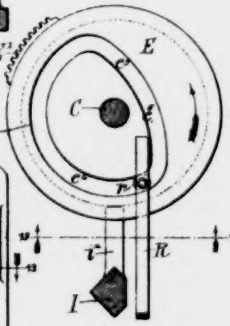


Fig. 12

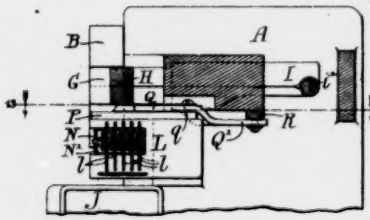


Fig. 15.

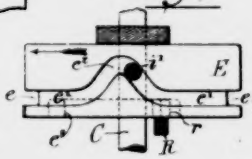
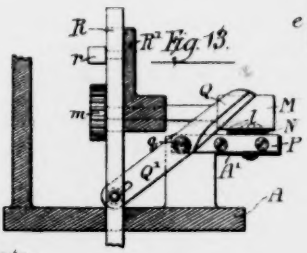


Fig. 13.



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by:- Dayton Poole & Brown.
his Attorneys.

Fig. 3. Fig. 15 is a horizontal section taken upon line 15 15 of Fig. 14, looking upwardly.

In the drawings, A indicates the frame of the machine as a whole. Said frame may be of any suitable form.

B is a block having two oblique faces on its upper surface, and which is attached to the frame at the front of the latter, said block constituting a support, upon which the corner of the box is placed at the time of applying the stay.

C is a shaft located in suitable bearings at the top of the frame, and by means of which motion is given to the several parts of the machine. Said shaft is provided with two main cam-wheels D and E, by which motion is given to the several parts of the machine.

G is a vertically-movable die or plunger arranged in guides *b b* upon the machine-frame and vertically over the form B.

H is a secondary plunger or strip-bender located at the rear of and sliding upon the main plunger G.

I is a lower die or anvil, which is supported upon the form B beneath the plunger G, and against which said plunger acts in the operation of the machine to press or clamp a stay-strip against a box-corner interposed between the said anvil or die and the said plunger. The upper surfaces *i i* of the anvil or die I are oblique and arranged at right angles with each other, and the upper die or plunger is also provided with working-faces *g g* at right angles with each other and forming an angular notch or recess, which fits over the die or anvil I, so as to press equally upon the adjacent sides of an interposed box-corner. The oblique sides of the die or anvil I and the form B are preferably made to approximately coincide with each other, so that both of said parts will afford support for the box corner in the operation of applying the stay thereto.

The die or anvil I is herein shown as made of square form and the block B as provided with a V-shaped notch *b* in its top to receive said die; but this particular shape of the said notch *b* and of the lower part of the anvil is obviously not essential, and they may be of any suitable shape. The said anvil I is herein shown as constructed to move horizontally and as extending through a
608 horizontal bearing-aperture *a* in the frame, by which it is supported, a horizontal movement being given to the said anvil to aid in turning in or pasting the stay-strips to the inside of the box-corner, as will hereinafter appear.

J is a well or receptacle for paste, located at one side of the clamping-dies, and K a reel, on which is wound a strip of paper or other fabric from which the stays are to be formed.

O is a pasting or gluing roller mounted in bearings over and extending into the well or receptacle J, and over which the strip passes from the reel K, and M N are feed-rollers operating in connection with an elastic bed L to feed forward the continuous stay-strip from the glue-roller toward and between the clamping-dies. The said elastic bed L consists of a series of parallel bars or wires *l l*, Figs. 11, 12, and 13, which are secured at their ends in the frame at either side of the rollers M and N. The lower feed-roller N is mounted to turn freely in its bearings, and is provided with a

plurality of circumferential grooves to receive the bars or wires *l l* of the elastic bed L, the narrow annular flanges or ribs formed by said grooves projecting upwardly between said bars or wires, so as to bear upon the under surface of the stay-strip. The said roller N is shown as mounted in a movable frame N′, sustained by a spring-arm *n*, which holds the roller N against the stay-strip. A cutting device for severing the continuous strip into pieces of suitable lengths to form the stay-strips or fastening-strips is located between the feed-rollers and the clamping-dies, and consists, as herein shown, of a stationary blade or cutter P, secured to the machine-frame at one side of the clamping-dies, and a vibrating knife or blade Q, pivoted to the said frame. The stationary blade or cutter P is herein shown as attached to an overhanging horizontal part A′ of the frame, which projects forward at one side of the clamping-dies, and on which the lower feed-roller N and elastic bed are supported, said part A′ being provided with a recess or opening to receive said lower feed-roller and the movable frame N′. The movable knife or blade Q is shown as located between the stationary blade and the clamping-dies and as mounted on a pivot *q*, secured on the part A′ of the frame.

Means are provided for actuating the several parts above described as follows: The cam-wheel D is located adjacent to and at the rear of the plunger G, and the latter is provided with a stud or roller *c* which engages with a cam-groove *d* on said cam-wheel, said cam-groove being so shaped as to give vertical reciprocatory motion to the plunger, and having a concentric part *d′*, which gives a dwell to the plunger when the latter is at the lower limit of its movement, and with an inwardly-deflected part d^2, which accomplishes the lifting and depression of said plunger. Said plunger G is preferably divided transversely into two separate parts G and G′, connected with each other by a sliding joint and having between them a rubber or other spring G^2, by means of which the lower portion of the plunger is adapted to yield upwardly to a slight extent when brought down upon the box, thus preventing shock and liability of breakage and rendering the upper plunger adjustable to boxes of different thicknesses.

The secondary plunger or strip bender H, which, as hereinbefore stated, operates in connection with the reciprocating die I for turning in the end of the stay-strip, rests and slides in a groove in the back of the main plunger G, Figs. 4 and 5, and is provided with a projection or shoulder *g′*, adapted for engagement with the cam surface D′ upon the rim of the cam-wheel D. The said cam-wheel is provided at one part of the said cam-surface D′ with a cam projection d^3, which acts to advance or depress said secondary plunger H relatively to the plunger G at a desired time in the operation of the parts. The plunger H is retracted or drawn up and held in contact with the rim of the cam D by means of a coiled spring which acts upon the plunger G and said plunger H. In the particular construction illustrated the said coiled spring *h* is located in a groove of the secondary plunger H, the lower end of the spring being attached to the secondary plunger, and the upper end thereof being attached to a pin *h′*, which projects from the main plunger into the said groove.

The horizontally-movable die I is provided at its rear end with a stud i', which rests in a cam-groove j in the cam-wheel E, said cam-groove being located in the outer or cylindric face of the cam-wheel, and being provided with a straight part e', which retains the die I in its forward or operative position during the greater part of the revolution of the cam, and with a rearwardly-deflected part e^2, which moves said die I backwardly or rearwardly, and then again forward to its normal position to accomplish the turning in of the stay-strip.

The upper feed-roller M is preferably corrugated or roughened on its surface, and serves, in connection with the elastic bed L, to carry or feed the strip forward over the said elastic bed. The said upper roller is operated by means of a segmental gear E′ on the cam-wheel E, which segmental gear engages with a cog-wheel m on the shaft of the roller M. Said segmental gear operates to turn the feed-roller once at each rotation of the cam-wheel a distance sufficient to feed forward a part of the strip of sufficient length to form a stay-strip.

The cutting device for severing the paper is actuated as follows: The movable blade or cutter Q is extended at its inner end past its pivotal point, so as to form a projecting arm Q′, which is pivoted at its rear end to a vertical slide R, which is held in the guide R′ on the machine-frame and is adapted to move vertically therein. Said slide-bar R is provided with a stud r, which rests in a cam-
609 groove e^3 of the cam-wheel E, which cam-groove is so shaped as to actuate said movable blade at the proper time to sever the strip, and having for this purpose a concentric part e^4, which acts to hold the movable blade elevated, and an inwardly-deflected part e^5, which acts to depress and elevate the said movable blade for severing the strip.

The machine may be driven by any suitable means, that shown in the drawings consisting of a belt-pulley S, mounted on the shaft C and adapted for connection therewith by means of a clutch s, which is connected with a treadle T at the bottom of the machine.

The operation of the machine, constructed as above described, is as follows: The continuous strip of paper or other fabric is drawn from the reel K by the feeding devices over the pasting-roller O, by which a suitable supply of adhesive material is applied to the lower side thereof. The strip is fed by the feeding devices between the blades P and Q of the cutting device and over the box-corner resting on the form B and die I at a time when the upper plunger is elevated and the die I is in its advanced or outward position, the gear-segment E′ being so located as to engage and operate the cog-wheel m, and thereby turn the feed-rollers when the main plunger is held in its elevated position by the engagement of the roller g with the concentric part d' of the cam-groove d. After the end of the strip has been advanced over the box-corner the cutting device is operated to sever the stay from the continuous strip, and the plunger G at the same time descends and presses the cut strip against the corner of the box and secures the same to the box-walls at either side of the corner. The movable blade Q of the cutting

device is actuated at the proper time by the action of the inwardly deflected part e^5 of the cam-groove e^3, which is so located as to give movement to the said blade shortly after the feed-roller ceases to move. The descent of the plunger G begins about the time the said blade begins to move, and the movement of the blade is somewhat faster than that of the plunger, owing to the fact that the roller *c* of said plunger is at this time in the central portion of the part d^2 of the cam-groove *d*, while the roller *r* is moving along the abrupt part of the groove e^3, so that the movable blade will have completed the effective part of its stroke at about the time that the plunger reaches a point opposite the stationary blade. In other words, the movable blade and plunger move downwardly at about the same time and the plunger reaches the level of the strip about the time that the same is severed by the cutters. Inasmuch as the corner or apex of a box resting upon the die I stands only slightly below the level of the stationary blade, after the strip has been fed forward over the box-corner it will either fall upon and adhere to the box corner before it is severed from the continuous strip or it will be carried downwardly against the box-corner by the descending plunger at the moment it is severed and before gravity has had time to act. In either case the liability of the severed strip being displaced after it is cut from the main or continuous strip is obviated, it being obvious that if from the stiffness of the material used for the stay-strip the end thereof which is thrust forward by the feed-rollers over the box-corner does not fall or bend by gravity, so as to bring its adhesive lower surface against the box-corner, the advance edges of the descending plunger, acting against one or both ends of the cut-off strip at the time the same is severed, will bring the middle of the strip immediately into contact with the box-corner, and thereby hold the strip in place until the end portions of the strip are carried downwardly and pressed against the sides of the box.

The machine herein shown is, as hereinbefore stated, constructed to turn into the inside of the box the projecting end of the stay, and for this purpose the stay-strip is made of such width and its guides are so arranged that the inner edge of the strip extends over or past the edge of the box-wall, so that when the stay is pasted down on the outside of the box-corner a loose or free end projects outward beyond the inner edge of the box. After the plunger G has pressed the stay upon the box the secondary plunger or strip-bender H then descends and bends or turns this loose end vertically downward, as shown in Fig. 8. This movement of the plunger H is accomplished by the action on the projection d' of the cam projection d^3 of the cam-surface D'. The secondary plunger then rises, and the die I, which has withdrawn from the notch *a* while the plunger H was descending by the action of the deflected part e^2 of the cam-groove *e*, moves forward again, and, catching the bent-down end of the stay, thrusts the same inside of the box-cover and presses it against the inside of the box, the upper plunger G meanwhile resting upon the box-corner, so as to retain the latter in place during the movement of the die I.

The operation of the parts in turning in the strip is clearly shown

in Figs. 8 and 9, Fig. 8 showing the position of the parts when the die is withdrawn and the plunger H advanced or depressed to bend downwardly the overhanging inner end or edge of the strip, and Fig. 9 showing the die I during its forward movement after the end of the strip has been carried inwardly and pressed against the inside of the box. During the withdrawal of the die I in the manner described the box-corner is sustained in position by means of the form B, the inclined sides of which, as before stated, are arranged in alignment with the working-faces of said die I. The main purpose of said form B is to sustain the box-corner when the die I is withdrawn; but said form is herein shown as made solid and provided with a notch to receive the end of the die I, so that the form
610 serves as a support for the said die under the downward pressure of the upper die or plunger, but by making the lower die I of sufficient strength or stiffness the use of the form B as a support therefor will not be necessary.

In many boxes the stay is simply pasted against the exterior surface of the box-corner and is not turned in or over the edge of the same, in which case the work can be done by using a non-reciprocating angular lower die or anvil and a single upper die or plunger. In such case the form B will obviously not be necessary as a part separate from the die; or, in other words, a single lower die or form will take the place of the form B and movable lower die I.

In some cases a continuous stay-strip may be employed, which is covered or coated with dry adhesive material, in which case water will be used in the receptacle J and the roller O will operate to moisten the strip only.

As far as the main features of my invention are concerned, forms other than those illustrated of the several parts of the machine may be employed without departure from my invention—as, for instance, in place of the particular mechanisms shown for feeding or delivering fastening-strips or stay-strips to and between the clamping-dies, or for applying paste or glue to the said stay-strips—other forms of strip feeding and pasting devices may be used in practice with the same general result, as above described.

I claim as my invention—

1. The combination, with opposing clamping-dies having diverging working faces, of a feeding mechanism constructed to deliver stay-strips between said clamping dies, and a pasting mechanism for rendering adhesive the stay-strips, said clamping-dies being constructed to co-operate in pressing upon interposed box-corners the adhesive stay-strips, substantially as described.

2. The combination, with opposing clamping dies having diverging working-faces, said clamping dies being arranged to co-operate in pressing adhesive fastening-strips upon interposed box-corners, a feeding mechanism constructed to feed forward a continuous fastening-strip, and a cutter for severing the said continuous strip into stay-strips of suitable lengths, substantially as described.

3. The combination, with opposing clamping-dies having diverging working-faces, said clamping-dies being arranged to co-operate in pressing an adhesive fastening-strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the

dies a continuous fastening-strip, a pasting mechanism for ap
adhesive substance to the strip, and a cutter for severing th
into stay-strips of suitable lengths, substantially as described

4. The combination, with opposing clamping-dies having
ing working-faces, said clamping-dies being constructed to co-o
in pressing an adhesive fastening-strip upon an interpose
corner, of a movable plunger or strip-bender constructed to
downwardly or inwardly a projecting end of the stay-strip, th
of the clamping-dies which engages the inner surface of th
corner being movable into and out of its usual working po
whereby it may engage and carry inside of the box-corner t
projecting end of the stay-strip, substantially as described.

5. The combination, with opposing clamping-dies having
ing working-faces, said clamping-dies being constructed to co-o
in pressing an adhesive fastening-strip upon an interpose
corner, of a movable plunger or strip-bender constructed to
downwardly or inwardly a projecting end of the stay-strip
one of said clamping-dies which engages the inner surface
box-corner having a reciprocatory motion in a direction p
with the box-corner, so as to carry inward and press again
inside of the box-corner the said projecting end of the stay
substantially as described.

6. The combination of opposing clamping-dies having div
working-faces constructed to co-operate in pressing an ad
stay-strip upon an interposed box-corner, one of said clampi
being constructed to act with an elastic or yielding pressure to
the dies to operate upon box-corners of different thickness
stantially as described.

7. The combination, with opposing clamping-dies having
ing working-faces, said clamping-dies being arranged to co-o
in pressing an adhesive fastening-strip upon an interposed b
ner, of a feeding mechanism constructed to feed forward a co
ous fastening-strip, a cutter for severing the strip into s
lengths, and a movable part or plunger which bends down
or inwardly the projecting end of the fastening-strip, that one
clamping-dies which engages the inside of the box-corner
constructed to reciprocate in a direction parallel with the box-
substantially as described.

8. The combination, with a form or stationary die provide
a recess or notch, of a reciprocating die constructed to fit th
and having diverging working-faces, a movable die or plung
vided with diverging working-faces corresponding with those
said reciprocating die, and a secondary movable die or plung
structed to bend downwardly or inwardly the projecting
the fastening-strip into position to be caught by the recipr
die, substantially as described.

In witness whereof I have hereunto signed my name in th
ence of two subscribing witnesses.

FRED H. BE

Witnesses:
MARK D. KNOWLTON.
N. A. GLAZIER.

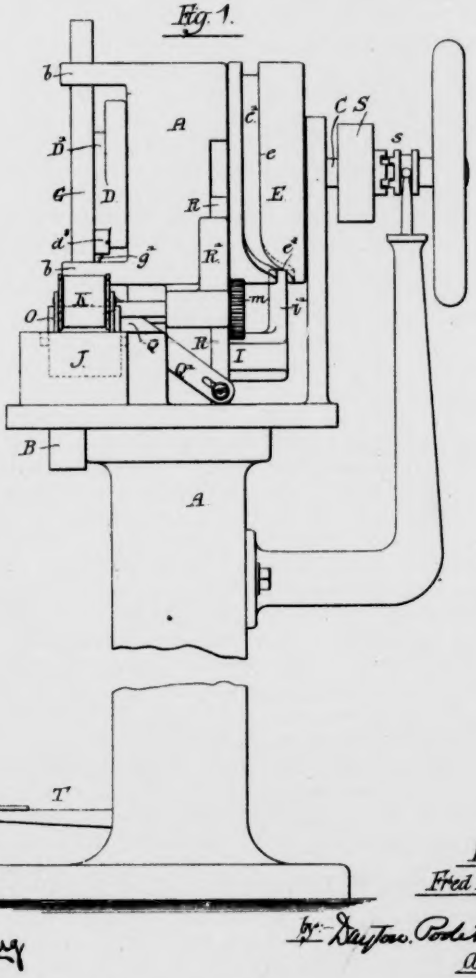
(No Model.) 3 Sheets—Sheet 1.

F. H. BEACH.

MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES.

No. 447,225. Patented Feb. 24, 1891.

Fig. 1.



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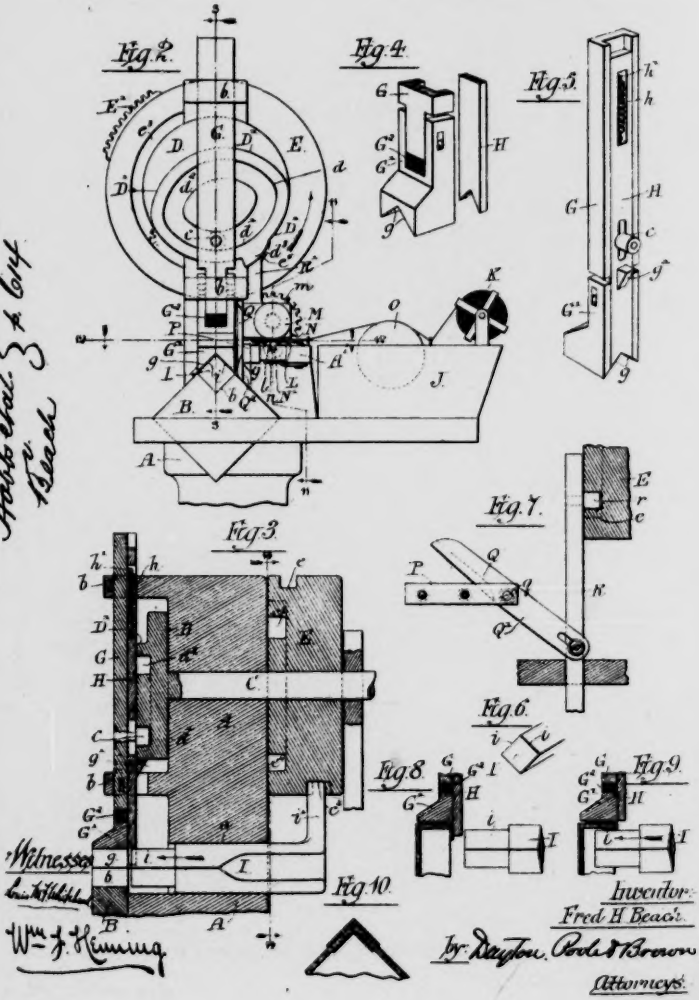
Attorneys.

(No Model.) 3 Sheets—Sheet 2.

F. H. BEACH.

MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES.

No. 447,225. Patented Feb. 24, 1891.



(No Model.) 3 Sheets—Sheet 3.

F. H. BEACH.

MACHINE FOR ATTACHING STAYS TO THE CORNERS OF BOXES.

No. 447,225. Patented Feb. 24, 1891.

Fig. 11.

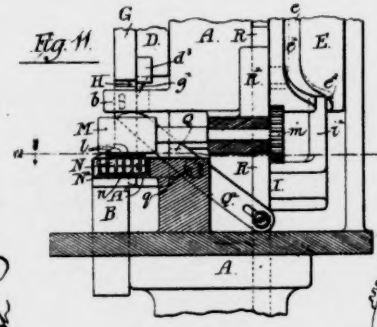


Fig. 14.

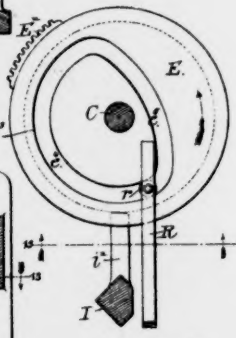


Fig. 12.

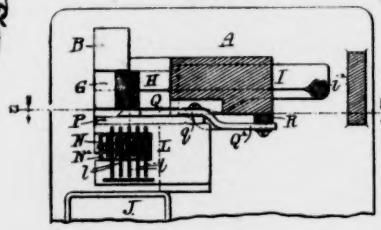


Fig. 15.

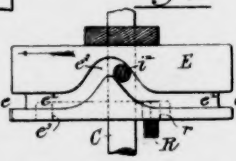
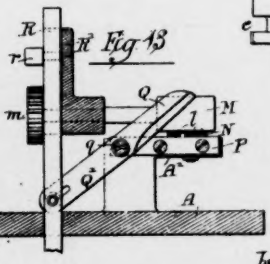


Fig. 13.



Witnesses
Chas. F. Hall
Wm. F. Hemming

Inventor
Fred. H. Beach.
by Dyrenforth, Poole & Brown,
Attorneys.

617 UNITED STATES PATENT OFFICE.

FRED H. BEACH, of Rochester, N. Y.

Machine for Attaching Stays to the Corners of Boxes.

Specification forming part of Letters Patent No. 447,225, dated February 24, 1891. Application filed June 10, 1885. Serial No. 168,218. (No model.)

To all whom it may concern:

Be it known that I, Fred H. Beach, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful improvement in machines for attaching stays to the corners of boxes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

It has been customary heretofore in making paper or straw-board boxes to apply a stay or fastening-strip over the joints at the corners of the boxes, which strip is pasted down on the outside of the box or is folded over the edge of the box and secured by paste both outside and inside of the corner, and such work, as far as I am aware, has heretofore been done by hand.

My invention relates to a machine for doing this work; and it consists in the matters hereinafter set forth, and pointed out in the appended claims.

(Here follow diagrams marked pp. 612, 614, & 616.)

In the accompanying drawings, illustrating my invention, figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a front elevation of the same in a plane at right angles to Fig. 1. Fig. 3 is a vertical cross-section taken upon line 3 3 of Fig. 2. Fig. 4 is a perspective view of the lower end of the upper die or plunger and the secondary or turning-in plunger of the machine. Fig. 5 is a perspective view of the two plungers when placed together, showing the entire length of the same as seen from the rear side thereof. Fig. 6 is a perspective view of the front end of the lower die. Fig. 7 is a detail side elevation of the shears or cutters by which the strip is severed. Figs. 8 and 9 are sectional views showing the opposing clamping-dies, illustrating the process of applying the stay to the corner of the box. Fig. 10 is a sectional view of one corner of the complete box, taken on a plane parallel with the bottom of the box. Fig. 11 is a vertical section of parts of the machine, taken upon line 11 11 of Fig. 2. Fig. 12 is a plan section taken upon line 12 12 of Figs. 2 and 11. Fig. 13 is a vertical section taken upon line 13 13 of Fig. 12, looking in the direction of the arrows in said figure. Fig. 14 is a detail section taken upon the

line 14 14 of Fig. 3. Fig. 15 is a horizontal section taken upon line 15 15 of Fig. 14, looking upwardly.

In the drawings, A indicates the frame of the machine as a whole. Said frame may be of any suitable form.

B is a block having two oblique faces on its upper surface, and which is attached to the frame at the front of the latter, said block constituting a support upon which the corner of the box is placed at the time of applying the stay.

C is a shaft, located in suitable bearings at the top of the frame, and by means of which motion is given to the several parts of the machine. Said shaft is provided with two main cam-wheels D and E, by which motion is given to the several parts of the machine.

G is a vertically-movable die or plunger or strip-bender, arranged in guides *b b* upon the machine-frame and vertically over the form B.

H is a secondary plunger, located at the rear of and sliding upon the main plunger G.

I is a lower die or anvil, which is supported upon the form B beneath the plunger G, and against which said plunger acts in the operation of the machine to press or clamp a stay strip against a box-corner interposed between the said anvil or die and the said plunger. The upper surfaces *i i* of the anvil or die I are oblique and arranged at right angles with each other, and the upper die or plunger is also provided with working-faces *g g* at right angles with each other and forming an angular notch or recess which fits over the die or anvil I so as to press equally upon the adjacent sides of an interposed box-corner. The oblique sides of the die or anvil I and the form B are preferably made to approximately coincide with each other, so that both of said parts will afford support for the box-corner in the operation of applying the stay thereto.

The die or anvil I is herein shown as made of square form, and the block B as provided with a V-shaped notch *b* in its top
618 to receive said die; but this particular shape of the said notch *b* and of the lower part of the anvil is obviously not essential, and they may be of any suitable shape. The said anvil I is herein shown as constructed to move horizontally and as extending through a horizontal bearing-aperture *a* in the frame, by which it is supported, a horizontal movement being given to the said anvil to aid in turning in or pasting the stay-strips to the inside of the box-corner stay-strips, as will hereinafter appear.

J is a well or receptacle for paste, located at one side of the clamping-dies, and K a reel on which is wound a strip of paper or other fabric, from which the stays are to be formed.

O is a pasting or gluing roller mounted in bearings over and extending into the well or receptacle J, and over which the strip passes from the reel K, and M N are feed-rollers operating in connection with an elastic bed L to feed forward the continuous stay-strip from the glue-roller toward and between the clamping-dies. The said elastic bed L consists of a series of parallel bars or wires *l l l*, Figs. 11, 12, and 13, which are secured at their ends in the frame at either side of the rollers M and N. The lower feed-roller N is

mounted to turn freely in its bearings and is provided with a plurality of circumferential grooves to receive the bars or wires *l l l* of the elastic bed L, the narrow annular flanges or ribs formed by said grooves projecting upwardly between said bars or wires, so as to bear upon the under surface of the stay-strip. The said roller N is shown as mounted in a movable frame N′, sustained by a spring-arm *n*, which holds the roller N against the stay-strip. A cutting device for severing the continuous strip into pieces of suitable lengths to form the stay-strips or fastening-strips is located between the feed-rollers and the clamping-dies, and consists, as herein shown, of a stationary blade or cutter P, secured to the machine-frame at one side of the clamping-dies, and a vibrating knife or blade Q, pivoted to the said frame. The stationary blade or cutter P is herein shown as attached to an overhanging horizontal part A′ of the frame, which projects forward at one side of the clamping-dies and on which the lower feed-roller N and elastic bed are supported, said part A′ being provided with a recess or opening to receive said lower feed-roller and the movable frame N′. The movable knife or blade Q is shown as located between the stationary blade and the clamping-dies and as mounted on a pivot *q*, secured on the part A′ of the frame.

Means are provided for actuating the several parts above described as follows: The cam-wheel D is located adjacent to and at the rear of the plunger G, and the latter is provided with a stud or roller *c*, which engages with a cam-groove *d* on said cam-wheel, said cam-groove being so shaped as to give vertical reciprocatory motion to the plunger and having a concentric part *d′*, which gives a dwell to the plunger when the latter is at the lower limit of its movement, and with an inwardly-deflected part d^2, which accomplishes the lifting and depression of said plunger. Said plunger G is preferably divided transversely into two separate parts G and G′, connected with each other by a sliding joint and having between them a rubber or other spring G^2, by means of which the lower portion of the plunger is adapted to yield upwardly to a slight extent when brought down upon the box, thus preventing shock and liability of breakage and rendering the upper plunger adjustable to boxes of different thicknesses.

The secondary plunger or strip-bender H, which, as hereinbefore stated, operates in connection with the reciprocating die I for turning in the end of the stay-strip, rests and slides in a groove in the back of the main plunger G, Figs. 4 and 5, and is provided with a projection or shoulder *g′*, adapted for engagement with the cam-surface D′ upon the rim of the cam-wheel D. The said cam-wheel is provided at one part of the said cam-surface D′ with a cam projection d^3, which acts to advance or depress said secondary plunger H relatively to the plunger G at a desired time in the operation of the parts. The plunger H is retracted or drawn up and held in contact with the rim of the cam D by means of a coiled spring *h*, which acts upon the plunger G and said plunger H. In the particular construction illustrated the said coiled spring *h* is located in a groove of the secondary plunger H, the lower end of the spring

being attached to the secondary plunger and the upper end thereo being attached to a pin h', which projects from the main plunge into the said groove.

The horizontally-movable die I is provided at its rear end with stud i', which rests in a cam-groove j in the cam-wheel E, said cam groove being located in the outer or cylindric face of the cam-whee and being provided with a straight part e', which retains the die in its forward or operative position during the greater part of th revolution of the cam, and with a rearwardly-deflected part, whic moves said die I backwardly or rearwardly, and then again for ward to its normal position, to accomplish the turning in of the stay strip.

The upper feed-roller M is preferably corrugated or roughened o its surface and serves, in connection with the elastic bed L, t carry or feed the strip forward over the said elastic bed. The sai upper roller is operated by means of a segmental gear E′ on th cam-wheel E, which segmental gear engages with a cog-wheel m o the shaft of the roller M. Said segmental gear operates t
619 turn the feed-roller once at each rotation of the cam-wheel distance sufficient to feed forward a part of the strip of suffi cient length to form a stay-strip.

The cutting device for severing the paper is actuated as follows The movable blade or cutter Q is extended at its inner end past it pivotal point, so as to form a projecting arm Q′, which is pivoted a its rear end to a vertical slide R, which is held in the guide R′ o the machine-frame, and is adapted to move vertically therein. Sai slide-bar R is provided with a stud r, which rests in a cam-groove of the cam-wheel E, which cam-groove is so shaped as to actuat said movable blade at the proper time to sever the strip, and hav ing for this purpose a concentric part e^4, which acts to hold th movable blade elevated, and an inwardly-deflected part e^5, whic acts to depress and elevate the said movable blade for severing th strip.

The machine may be driven by any suitable means, that show in the drawings consisting of a belt-pulley S, mounted on the sha C and adapted for connection therewith by means of a clutch which is connected with a treadle T at the bottom of the machine.

The operation of the machine, constructed as above described, i as follows: The continuous strip of paper or other fabric is draw from the reel K by the feeding devices over the pasting-roller O, b which a suitable supply of adhesive material is applied to the lowe side thereof. The strip is fed by the feeding devices between th blades P and Q of the cutting device and over the box-corner rest ing on the form B and die I at a time when the upper plunger i elevated and the die I is in its advanced or outward position, th gear-segment E′ being so located as to engage and operate the cog wheel m, and thereby turn the feed-rollers when the main plunge is held in its elevated position by the engagement of the roller with the concentric part d' of the cam-groove d. After the end the strip has been advanced over the box-corner the cutting devic is operated to sever the stay from the continuous strip and th

plunger G at the same time descends and presses the cut strip against the corner of the box and secures the same to the box-walls at either side of the corner. The movable blade Q of the cutting device is actuated at the proper time by the action of the inwardly-deflected part e^5 of the cam-groove e^3, which is so located as to give movement to the said blade shortly after the feed-roller ceases to move. The descent of the plunger G begins about the time the said blade begins to move, and the movement of the blade is somewhat faster than that of the plunger, owing to the fact that the roller *c* of said plunger is at this time in the central portion of the part d^2 of the cam-groove *d*, while the roller *r* is moving along the abrupt part of the groove e^3, so that the movable blade will have completed the effective part of its stroke at about the time that the plunger reaches a point opposite the stationary blade. In other words, the movable blade and plunger move downwardly at about the same time and the plunger reaches the level of the strip about the time that the same is severed by the cutters. Inasmuch as the corner or apex of a box resting upon the die I stands only slightly below the level of the stationary blade, so that after the strip has been fed forward over the box-corner it will either fall upon and adhere to the box-corner before it is severed from the continuous strip, or it will be carried downwardly against the box-corner by the descending plunger at the moment it is severed and before gravity has had time to act. In either case the liability of the severed strip being displaced after it is cut from the main or continuous strip is obviated, it being obvious that if from the stiffness of the material used for the stay-strip the end thereof which is thrust forward by the feed-rollers over the box-corner does not fall or bend by gravity, so as to bring its adhesive lower surface against the box-corner, the advance edges of the descending plunger, acting against one or both ends of the cut off strip at the time the same is severed, will bring the middle of the strip immediately into contact with the box-corner, and thereby hold the strip in place until the end portions of the strip are carried downwardly and pressed against the sides of the box.

The machine herein shown is, as hereinbefore stated, constructed to turn into the inside of the box the projecting end of the stay, and for this purpose the stay-strip is made of such width and its guides are so arranged that the inner edge of the strip extends over or past the edge of the box-wall, so that when the stay is pasted down on the outside of the box-corner a loose or free end projects outward beyond the inner edge of the box. After the plunger G has pressed the stay upon the box the secondary plunger or strip-bender H then descends and bends or turns this loose end vertically downward, as shown in Fig. 8. This movement of the plunger H is accomplished by the action on the projection d' of the cam projection d^3 of the cam-surface D'. The secondary plunger then rises, and the die I, which has withdrawn from the notch *a* while the plunger H was descending by the action of the deflected part e^2 of the cam-groove *e*, moves forward again, and, catching the bent-down end of the stay, thrusts the same inside of the box-cover and presses

it against the inside of the box, the upper plunger G meanwhile resting upon the box-corner so as to retain the latter in place during the movement of the die I.

The operation of the parts in turning in the strip is clearly shown in Figs. 8 and 9, Fig. 8 showing the position of the parts when the die is withdrawn and the plunger H advanced or depressed to bend downwardly the overhanging inner end or edge of the strip, and Fig. 9 showing the die I during its forward movement, after the end of the strip has been carried inwardly and pressed against the inside of the box. During the withdrawal of the die I in the manner described the box-corner is sustained in position by means of the form B, the inclined sides of which, as before stated, are arranged in alignment with the working-faces of said die I. The main purpose of said form B is to sustain the box-corner when the die I is withdrawn; but said form is herein shown as made solid and provided with a notch to receive the end of the die I, so that the form serves as a support for the said die under the downward pressure of the upper die or plunger; but by making the lower die I of sufficient strength or stiffness the use of the form B as a support therefor will not be necessary.

In many boxes the stay is simply pasted against the exterior surface of the box-corner and is not turned in or over the edge of the same, in which case the work can be done by using a non-reciprocating angular lower die or anvil and a single upper die or plunger. In such case the form B will obviously not be necessary as a part separate from the die; or, in other words, a single lower die or form will take the place of the form B and movable lower die I.

In some cases the continuous stay-strip may be employed, which is covered or coated with dry adhesive material, in which case water will be used in the receptacle J, and the roller O will operate to moisten the strip only.

As far as the main features of my invention are concerned, forms other than those illustrated of the several parts of the machine may be employed without departure from my invention—as, for instance, in place of the particular mechanisms shown for feeding or delivering fastening-strips or stay-strips to and between the clamping-dies, or for applying paste or glue to the said stay-strips, other forms of strip feeding and pasting devices may be used in practice with the same general result as above described.

I claim as my invention—

1. The combination, with opposing clamping-dies having diverging working-faces, of a feeding mechanism constructed to deliver stay-strips between said clamping-dies, and a pasting mechanism for rendering adhesive the stay-strips. said clamping-dies being constructed to co-operate in pressing upon interposed box-corners the adhesive stay-strips, substantially as described.

2. The combination, with opposing clamping-dies having diverging working-faces, said clamping-dies being arranged to co-operate in pressing adhesive fastening-strips upon interposed box-corners, a feeding mechanism constructed to feed forward a continuous fasten-

ing-strip, and a cutter for severing the said continuous strip into stay-strips of suitable lengths, substantially as described.

3. The combination, with opposing clamping-dies having diverging working-faces, said clamping-dies being arranged to co-operate in pressing an adhesive fastening-strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the dies a continuous fastening-strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strip into stay-strips of suitable lengths, substantially as described.

4. The combination, with opposing clamping-dies having diverging working-faces, said clamping-dies being constructed to co-operate in pressing an adhesive fastening-strip upon an interposed box-corner, of a movable plunger or strip-bender constructed to bend downwardly or inwardly a projecting end of the stay-strip, that one of the clamping-dies which engages the inner surface of the box-corner being movable into and out of its usual working-position, whereby it may engage and carry inside of the box-corner the said projecting end of the stay-strip, substantially as described.

5. The combination, with opposing clamping-dies having diverging working-faces, said clamping-dies being constructed to co-operate in pressing an adhesive fastening-strip upon an interposed box-corner, of a movable plunger or strip-bender constructed to bend downwardly or inwardly a projecting end of the stay-strip, that one of said clamping-dies which engages the inner surface of the box-corner having a reciprocatory motion in a direction parallel with the box-corner, so as to carry inward and press against the inside of the box-corner the said projecting end of the stay-strip, substantially as described.

6. The combination of opposing clamping-dies having diverging working-faces constructed to co-operate in pressing an adhesive stay-strip upon an interposed box-corner, one of said clamping-dies being constructed to act with an elastic or yielding pressure to enable the dies to operate upon box-corners of different thicknesses, substantially as described.

7. The combination, with opposing clamping-dies having diverging working-faces, said clamping-dies being arranged to co-operate in pressing an adhesive fastening-strip upon an interposed box-corner, of a feeding mechanism constructed to feed forward a continuous fastening-strip, a cutter for severing the strip into suitable lengths, and a movable part or plunger which bends downwardly or inwardly the projecting end of the fastening-strip, that one of the clamping-dies which engages the inside of the box-corner being constructed to reciprocate in a direction parallel with the box-corner, substantially as described.

621 8. The combination, with a form or stationary die provided with a recess or notch, of a reciprocating die constructed to fit the notch and having diverging working-faces, a movable die or plunger provided with diverging working-faces corresponding with those of the said reciprocating die, and a secondary movable die or plunger constructed to bend downwardly or inwardly the projecting

end of the fastening strip into position to be caught by the reciprocating die, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRED H. BEACH.

Witnesses:
R. F. OSGOOD.
E. STARING.

(Here follow diagram- marked pp. 623, 625, & 627.)

628 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

Certificate of Clerk to Volume II, Exhibits of Letters Patent.

UNITED STATES OF AMERICA, *First Judicial Circuit,* } *ss:*

I, John G. Stetson, clerk of the United States circuit court of appeals for the first circuit, certify that the foregoing printed pages, 365 to 628, inclusive, contain and are a true copy of volume II, exhibits of letters patent, in a cause pending in the circuit court of the United States for the district of Massachusetts, entitled Fred H. Beach, complainant, *v.* Clarence W. Hobbs *et al.*, defendants, as said exhibits of letters patent were transmitted to the United States circuit court of appeals for the first circuit as a part of the record of said circuit court in said cause upon the appeal of the said complainant from an interlocutory decree of said circuit court in said cause to said United States circuit court of appeals for the first circuit.

I further certify that this volume II is the volume referred to as volume II in my final certificate, bearing even date herewith, contained in volume IV, of the record and all proceedings in
628*a* this case, page 683.

Seal United States Circuit Court of Appeals, First Circuit.

In testimony whereof I hereunto set my hand and affix the seal of said United States circuit court of appeals for the first circuit, at Boston, in said first circuit, this twentieth day of July, A. D. 1899.

JOHN G. STETSON, *Clerk.*

16701 0

FOLD OUT IS TOO LARGE TO BE FILMED

629 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS *et al.*, Defendants, Appellees. } No. 246.

CLARENCE W. HOBBS *et al.*, Defendants, Appellants,
v.
FRED H. BEACH, Complainant, Appellee. } No. 247.

Transcript of Record of Circuit Court.

(Filed in circuit court of appeals March 19, 1898.)

UNITED STATES OF AMERICA, *District of Massachusetts*, } *ss*:

At a circuit court of the United States for the first circuit, begun and holden at Boston, within and for the district of Massachusetts, on Friday, the fifteenth day of October, in the year of our Lord one thousand eight hundred and ninety-seven.

Before the Honorable William L. Putnam, circuit judge.

630 FRED H. BEACH, Complainant,
v.
CLARENCE W. HOBBS ET AL., Defendants. } No. 256. Equity (No. 2988, Old Docket).

The bill of complaint in this cause was filed in the clerk's office on the third day of May, A. D. 1892, and was duly entered at the October term of this court, A. D. 1891, and is in the words and figures following:

Bill of Complaint.

(Filed May 8, 1892.)

(MEMORANDUM.—The bill of complaint, as printed in this Transcript of Record, commencing on page 1, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

This cause was thence continued to the May term, A. D. 1892, when the following answer was filed:

Answer.

(Filed June 29, 1892.)

(MEMORANDUM.—The answer, as printed in this Transcript of Record, commencing on page 7, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

At the same term the following replication was filed:

Replication.

(Filed June 29, 1892.)

(MEMORANDUM.—The replication, as printed in this Transcript of Record, on page 12, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

Also at the same term the following amendment to bill of complaint was filed by consent:

Amendment to Bill of Complaint.

(Filed by consent July 13, 1892.)

(MEMORANDUM.—The amendment to bill of complaint, as printed in this Transcript of Record, commencing on page 6, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

631 This cause was thence continued to the October term, A. D. 1892, when the following amendment to answer was filed by consent:

Amendment to Answer.

(Filed by consent Dec. 1, 1892.)

(MEMORANDUM.—The amendment to answer, as printed in this Transcript of Record, on page 11, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

This cause was thence continued from term to term to the October term, A. D. 1895, when, upon the filing of the following affidavit of complainant, and upon granting of the complainant's motion for leave to amend bill of complaint the following order of court was entered:

Order of Court.

November 5, 1895.

(MEMORANDUM.—The order of court, as printed in this Transcript of Record, commencing on page 340, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

Affidavit of Fred H. Beach.

(Filed Nov. 5, 1895.)

(MEMORANDUM.—The affidavit of Fred H. Beach, as printed in this Transcript of Record, commencing on — 339, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

At the same term the following stipulation was filed:

Stipulation.

(Filed Dec. 14, 1895.)

(MEMORANDUM.—The stipulation, as printed in this Transcript of Record, on page 342, volume I, is here inserted.—Alex. H. Trowbridge, clerk.)

This cause was thence continued from term to term, to the May term, A. D. 1897, when, publication of the testimony having passed in the clerk's office, the same was set down for hearing, and fully heard by the court on May 27 and 28, 1897.

On the twenty-third day of August, A. D. 1897, the opinion of the court was announced.

632 At the same term, the following suggestion of death of Richard Sugden was filed:

Suggestion of Death of Richard Sugden.

(Filed Sept. 16, 1897.)

Now comes Clarence W. Hobbs, one of the defendants mentioned in the bill of complaint in the above-entitled suit, and suggests upon the record the death of Richard Sugden, named as defendant in said bill of complaint.

By his solicitor, EDWARD S. BEACH.

This cause was thence continued to the present October term, A. D. 1897, when, to wit, Nov. 30, 1897, a decree in favor of the complainant for an injunction and account as to the sixth claim only of the patent in suit, is entered.

On the twelfth day of January, A. D. 1898, the decree entered on the thirtieth day of November, A. D. 1897, is vacated, upon the suggestion being made that the death of Richard Sugden, one of the defendants, had been suggested Sept. 16, 1857.

On the twelfth day of January, A. D. 1898, the following bill of revivor is filed by leave of court:

Bill of Revivor.

(Filed Jan. 12, 1898.)

Fred H. Beach, of Rochester, county of Monroe, State of New York, having a place of business in said Rochester, brings this his bill of revivor against George A. Craig and Isaac L. Prouty, as executors of the last will and testament of Richard Sugden, late copartner with Clarence W. Hobbs, a surviving partner, and who with said Richard Sugden constituted the firm known as, and doing business under the name and style "The Hobbs Manufacturing Company."

And thereupon your orator complains and says that on or about the third day of May, 1892, your orator filed a bill in equity in this court "against Clarence W. Hobbs and Richard Sugden, having a place and doing business as manufacturers of paper-box machinery, etc., under the title and style of 'Hobbs Manufacturing
633 Company,' in the city of Worcester, Massachusetts, and residents of said district," alleging infringement by them of a certain reissued letters patent, numbered 11167, dated May 26, 1891, of which your orator was at that time, and is now, the sole owner.

That thereafter the said Clarence W. Hobbs and Richard Sugden having been duly served with the writs of subpœna, appeared by counsel, and filed their answer to said bill of complaint to which answer a replication was filed on the part of your orator.

That thereafter your orator proceeded to take proof in support of the said bill of complaint; and thereafter said defendants proceeded to take proof in support of their said answer and in defence of said action.

That thereafter said suit was brought to final hearing before the Honorable William L. Putnam; that said judge filed his decision on the twenty-third day of August, 1897, adjudging the validity of the claims of the patent sued upon, and that defendants infringed the sixth claim thereof, being one of the claims in suit; but that defendants did not infringe the first, second and third claims of said reissued letters patent as charged, etc., as by reference to said decision, reported in 82 Fed. Rep., 916–928, will more fully appear, etc.

That thereafter your orator filed a petition and motion for a rehearing, which motion was denied by said court on the 18th of October, 1897. (See 82 Fed. Rep., 928.)

That thereafter your orator, at the request of this court, caused a draft for a decretal order to be filed with the clerk of said court, which draft was filed on or about the eleventh day of September, 1897, and defendants were required by said court to file their corrections, on or before the eighteenth day of September, 1897, and that thereafter, to wit, November 4, 1897, this court, through the clerk thereof, requested your orator's counsel to modify his form of draft of decretal order, which draft was accordingly modified and signed by his honor Judge Putnam on or about the thirtieth day of November, 1897.

That thereafter your orator, as well as defendants Clarence W. Hobbs *et al.*, filed petitions and assignment of errors, etc., for an appeal to the United States circuit court of appeals from the decisions of the circuit court for said district of Massachusetts, and
634 that while said petitions for appeal were pending, the fact was discovered by the court and your orator, that Richard Sugden, one of the said defendants named in said bill of complaint, had departed this life, etc.

That it appears that the aforesaid Richard Sugden died on the ninth day of January, 1895, leaving a last will and testament which, on the fifth day of February, 1895, was admitted to probate in the probate court of Worcester county, held at the city of Worcester, Massachusetts, and letters executory thereupon were, upon the day

last named, duly issued out of said probate court unto George A. Craig and Isaac L. Prouty and still remain in full force and virtue.

Wherefore, your orator prays that the said cause may be revived by the decree of this honorable court, and that it may proceed to a decree in his favor in accordance with the prayer of the original bill of complaint herein.

Your orator further prays that a writ of subpœna may issue in due form of law, directed to the aforesaid defendants, George A. Craig and Isaac L. Prouty, as executors of the estate of Richard Sugden, deceased, and requiring them to appear and show cause, if any they have, why this cause, so far as it relates to the interests of the Sugden estate, should not be revived; and if no cause shall be shown by said defendants why said suit should not berevived, that a decree be entered reviving said suit in favor of your orator.

And your orator will ever pray, etc.

FRED H. BEACH,
By his attorney-in-fact, JOHN DANE, JR.

JOHN DANE, JR.,
Solicitor and of Counsel for Complainant, 261 Broadway, New York.

STATE OF NEW YORK, }
County of New York, } *ss:*

John Dane, Jr., being duly sworn deposes and says that he is the attorney-in-fact for Fred H. Beach, the complainant herein; and that he has read the foregoing bill of revivor and knows the contents thereof, and that the same is true of his own knowledge and belief.

635 Deponent further says that the reason why this verification is not made by the complainant, is that said Fred H. Beach is now in England engaged in the prosecution of some suits there.

JOHN DANE, JR.

Subscribed and sworn to before me this the third day of January, 1898.

[SEAL.] JOHN T. FENLON,
Notary Public, N. Y. Co.

Whereupon a subpœna duly issued directed to George A. Craig and Isaac L. Prouty, as executors of the last will and testament of Richard Sugden, late copartner with Clarence W. Hobbs, a surviving partner, and who with said Richard Sugden constituted the firm known as and doing business under the name and style "the Hobbs Manufacturing Company," commanding them to appear at the rules to be holden at the office of the clerk of this court, in Boston, on the seventh day of February, 1898, to answer thereto; whereupon the marshal of our district made his return as follows:

Officer's Return on Subpœna.

UNITED STATES OF AMERICA, *Massachusetts District*, } ss :

BOSTON, *January* 14, 1898.

I hereby certify that I have served the within subpœna by giving in hand this day to the within-named George A. Craig, at Spencer, a true and attested copy of this precept. I also, on the same day, left at the last and usual place of abode of the within-named Isaac L. Prouty, at Spencer, in the hands of Mrs. Emma L. Young, his daughter, a true and attested copy of this precept.

ALBERT TUTTLE,
Deputy United States Marshal.

Fees.

Service	$4 00
Copies	1 00
Travel	3 84
	$8 84

636 On the nineteenth day of February, A. D. 1898, it is ordered that the bill stand revived and that the bill of revivor be taken *pro confesso* as against George A. Craig and Isaac L. Prouty, executors of the estate of Richard Sugden, pursuant to the agreement on file.

On the same day the following decree for perpetual injunction and for reference to a master is filed:

Decree for Perpetual Injunction and for Reference to a Master.

February 19, 1898.

This cause came on to be heard at a regular term of the United States circuit court upon the pleadings and proofs, and was argued by counsel for the respective parties on the twenty-seventh and twenty-eighth days of May, 1897, before the Honorable William L. Putnam, circuit judge, and upon consideration thereof,

It is ordered, adjudged and decreed, as follows, viz., that the reissued letters patent referred to in the complainant's bill, being reissued letters patent of the United States, granted unto Fred H. Beach, complainant, was the original and first inventor of the machine described and claimed in the sixth claim thereof, and that the said defendants have infringed the said patent as to its sixth claim, and upon the exclusive right of the complainant under the same, and that claims 1, 2 and 3 have not been infringed.

And it is further ordered, adjudged and decreed that complainant recover of the defendants the profits that they have received or made, or which have accrued to them from said infringement, by the manufacture, use or sale of the machine described and secured by the sixth claim of said reissued letters patent at any and all

times since the twenty-sixth day of May, 1897, and in addition thereto the damage which the complainant has sustained thereby.

And it is further ordered, adjudged and decreed, that it be referred to —— ——, a master of this court, to take and report to the court an account of the profits which the said defendants have received or which have arisen or accrued to them from the infringement of the said patented invention under the sixth claim of said patent, by unlawfully making, using, or vending the same, as alleged in the bill, and to ascertain and report the damages, if
637 any, in addition to the profits, which the complainant has sustained thereby since the twenty-sixth day of May, 1891.

And it is further ordered, adjudged and decreed that a perpetual injunction be issued against the defendants according to the prayer of the bill, so far as relates to said sixth claim only.

And it is further ordered, adjudged and decreed that all questions as to costs be reserved until final decree.

By the court:

ALEX. H. TROWBRIDGE, *Clerk.*

From the decree for perpetual injunction and for reference to a master both the complainant and the defendants claim appeals to the United States circuit court of appeals for the first circuit. The appeals are allowed without security for prosecution thereof, bonds thereon having been respectively waived by the parties.

A true record.

Attest: ALEX. H. TROWBRIDGE, *Clerk.*

(MEMORANDUM.—The opinion of the circuit court, which is inserted here in the original transcript of record, is bound in, at the end of this printed record, as pages 647 to 661. John G. Stetson, clerk.)

Complainant's Prayer for Appeal and Assignment of Errors.

(Filed Feb. 19, 1898.)

Prayer for appeal.

Complainant in the above-entitled cause considering himself aggrieved by the decision and opinion of the court, filed August 23, 1897, directing that a decree be entered for defendants under the first, second and third claims of the Beach reissued patent No. 11167, upon which this suit is based, hereby appeals from said decision, opinion and decree entered thereunder, and prays that complainant's said appeal be allowed, and that a transcript of the record of the case, duly authenticated, together with this application
638 for an appeal and the accompanying assignment of errors may be transmitted to the United States circuit court of appeals in and for the first judicial circuit.

JOHN DANE, JR.,
Solicitor and Counsel for Fred H. Beach.

Assignment of Errors.

And now comes Fred H. Beach, complainant in the above-entitled suit, in which an interlocutory decree granting an injunction in part, and denying an injunction in part, against said defendants, Clarence W. Hobbs and others, composing the concern known as the Hobbs Manufacturing Company, has heretofore been entered, and under and pursuant to section 7 of the act of Congress, approved March 3, 1891, entitled "An act to establish circuit courts of appeals," and prays an appeal to the United States circuit court of appeals in and for the first circuit from so much of the opinion and the said interlocutory decree entered in said suit, as relates to the refusal of the court to grant a decree for an injunction to issue against defendants, for the infringement of the first, second and third claims of complainant's reissued patent, No. 11167, etc., and for reason of appeal assign- the following as errors:

(1.) That the circuit court erred in holding that the first, second and third claims of said reissued letters patent, No. 11167, granted and issued to Fred. H. Beach (complainant), on the twenty-sixth day of May, 1891, for machines for attaching stays to the corners of boxes, were not infringed by defendants.

(2.) That the circuit court erred in holding that defendants did not infringe the first, second and third claims of the said reissued letters patent, No. 11167, to Fred H. Beach, because the feeding mechanism of the patent and that of the defendants' machine appeared to the court to be unlike.

(3.) That the circuit court erred in holding that the words "substantially as described;" contained in the first, second and third claims of complainant's patent limits and restricts said claim to an extent that defendants' machines do not infringe them.

639 (4.) That the circuit court erred in holding that the feeding mechanism of defendants' machine was not the equivalent of the feeding mechanism of the first, second and third claims of complainant's patent.

(5.) That the circuit court erred in holding that the feeding mechanism of defendants' machine was less complex than the feeding mechanism set forth in the first, second and third claims of said reissued letters patent No. 11167, granted to Fred H. Beach, complainant.

(6.) That the circuit court erred in holding that the old and well-known feeding mechanism employed by defendants in their machine was not substantially the same (in combination with the other factors therein) as the feeding mechanism of the first, second and third claims of said reissued letters patent No. 11167 of complainant.

(7.) That the circuit court erred in holding that the "feeding mechanism" of defendants' machine, which was known at the date of complainant's reissued patent as a substitute for, and the equivalent of, the feeding mechanism set forth in the first, second and third claims of complainant's reissued letters patent No. 11167, was not embraced within the scope of said claims.

(8.) That the circuit court erred in holding that respondents have omitted in the construction of their feeding mechanism, complex or complicated details, supposed (by the court) to be contained in the feeding mechanism described and shown in the patented invention set forth in the first, second and third claims of complainant's reissued patent No. 11167.

(9.) That the circuit court erred in holding that in its opinion the courts in the second circuit did not consider the limitations imposed upon the applicant by the Patent Office officials, upon the first three claims of complainant's said patent No. 11167.

(10.) That the circuit court erred in holding that "the feeding mechanism" of complainant's reissued patent No. 11167, is "expressed to be of detailed character, apparently having in view special functions," etc.

(11.) That the circuit court erred in holding that the work to be done by respondents' machine is much simpler than that
640 which can be accomplished by complainant's, whereas in fact, the stay machine of complainant's patent is capable of, and in practice, does apply strips, either to the outside corners of the box solely, or to the outside and inside at one and the same operation, at the pleasure of the constructor or operator.

(12.) That the circuit court erred in holding that the pith of the invention found in the patented machine of Beach, is contained in the sixth claim of said patent No. 11167.

(13.) That the circuit court erred in deciding the case contrary to the evidence as disclosed therein.

(14.) That the circuit court erred in limiting the scope of the first, second and third claims of said patent, because of a difference in the form of the feeding mechanism adopted by defendant, from that shown in the Beach patent.

(15.) That the circuit court erred in limiting the scope of the first, second and third claims of the Beach patent by selecting the feeding mechanism as the basis for such limitation, which feeding mechanism of defendants was an old and well-known mechanism at the date of the Beach patent No. 11167, and a known substitute therefor.

(16.) That the circuit court erred in selecting the feeding mechanism of complainant's patent to justify its limitation of the first, second and third claims, and excluding the cutting mechanism of the same claims, which cutting mechanism differs as much from the cutting mechanism of defendants' machine, as does the said feeding mechanism of complainant's patent and that of defendants' machine.

(17.) That the circuit court erred in discriminating between the several factors entering into, and which compose the elements of, the said first, second and third claims of the Beach patent, in view of the fact that no invention is claimed by the patentee Beach for any one of the said elements or factors which compose each of the combinations set forth in the said first three claims of the patent No. 11167.

(18.) That the circuit court erred in deciding that the claims for a combination of old and well-known mechanisms brought into a new

organization for the first time, and for a new purpose never
641 before attained by any automatic mechanism, should be limited to those specified in the specifications, and shown in the drawings thereof, especially where the specifications distinctly state the fact, that forms of mechanism other than those shown and described, may be employed.

(19.) That the circuit court erred in holding that complainant, the inventor of a combination composed of old and well-known mechanisms, who brought into and created a new organization for the first time and for a use for which no machine had been previously constructed (and therefore a "new art"), should be excluded from substituting and embracing other mechanisms that were old and well-known equivalents for the mechanisms set forth in, and which constitute the essential factors of, the combinations of the first, second, and third claims of complainant's patent.

(20.) That the circuit court erred in not giving due consideration to the opinion of the circuit court of appeals in the second circuit, which in plain language decided that, "the first, second, and third claims are broad ones, without restrictions to the details of mechanical construction," etc.

(21.) That the circuit court erred in deciding against complainant on the first, second, and third claims of complainant's patent, it being contrary to the evidence disclosed by the record in the case, and contrary to the established rules as defined and laid down by the Supreme Court of the United States.

JOHN DANE, JR.,
Solicitor and Counsel for Complainant.

Complainant's Citation on Appeal.

UNITED STATES OF AMERICA, *ss:*

The President of the United States to Clarence W. Hobbs and also George A. Craig and Isaac L. Prouty, as executors of the estate of the late Richard Sugden, deceased, Greeting:

You are hereby cited and admonished to be and appear in the United States circuit court of appeals for the first circuit, in the city of Boston, Massachusetts, on the nineteenth day of March next, pursuant to an appeal duly obtained from a decree of the circuit
642 court of the United States for the district of Massachusetts, wherein Fred H. Beach, of Rochester, in the State of New York, is complainant and appellant and you are appellees, to show cause, if any there be, why the said decree, entered against the said appellant, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

Witness the Honorable William L. Putnam, judge of the circuit court of the United States for the district of Massachusetts, this nineteenth day of February, in the year of our Lord one thousand eight hundred and ninety-eight.

WILLIAM L. PUTNAM,
Circuit Judge.

Acknowledgment of Service on Citation on Appeal.

Service accepted.

EDWARD S. BEACH,
For C. W. Hobbs.
ALBERT P. WORTHEN,
For Craig & Prouty, Executors of Estate Late Richard Sugden.

Defendants' Prayer for Appeal and Assignment of Errors.

(Filed Feb. 19, 1898.)

Prayer for appeal.

The defendants in the above-entitled cause, considering themselves aggrieved by the decision and opinion of the court, filed August 23, 1897, directing that a decree be entered for complainant under the sixth claim of the Beach reissued patent in suit, hereby appeals from the said decision and opinion and the decree entered thereunder, and pray that these defendants' said appeal be allowed, and that a transcript of the record of the case, duly authenticated, together with this application for an appeal and the accompanying assignment of errors, may be transmitted to the United States circuit court of appeals for the first circuit.

EDWARD S. BEACH,
For Clarence W Hobbs and the Legal Representatives of Richard Sugden, Deceased.

643 *Assignment of Errors.*

1. The court erred in not holding that claim 6 is void for want of patentable invention in view of the prior art.
2. The court erred in not holding that claim 6 is void because of insufficient enumeration of elements to produce a patentable improvement in machines for attaching stays to the corners of boxes.
3. The court erred in not holding that claim 6 is void because of unlawful enlargement of the original specification in respect of said claim.
4. The court erred in not holding that claim 6 is void because the subject-matter thereof had been in public use in the United States for more than two years prior to the filing of said claim 6.
5. The court erred in holding that defendants infringed said claim 6.
6. The court erred in not holding that the reissued patent in suit is void because the original thereof was not inoperative or invalid in any respect whatever.
7. The court erred in not holding that claims 1 and 2 of the reissued patent in suit are each invalid because of insufficient enumeration of elements to produce an operative combination within the requirements of said patent.
8. The court erred in saying, " We bear in mind that the recip-

rocating plates of the respondents' mechanism, carrying the stay strip, is generally regarded as the equivalent of the complainant's feed-rolls with their intermittent motion;" and in not holding that the record does not show such to be the fact, and that there is no evidence tending to show that either defendants' severing mechanism or defendants' feeding mechanism was known at the date of complainant's original patent as a proper substitute for either complainant's severing mechanism or complainant's feeding mechanism.

EDWARD S. BEACH,
For Clarence W. Hobbs and the Legal Representatives of Richard Sugden, Deceased.

Appeal bond having been waived, this appeal is allowed to operate as a supersedeas.

W. L. PUTNAM,
Circuit Judge.

February 19, 1898.

644 *Defendants' Citation on Appeal.*

UNITED STATES OF AMERICA, *ss:*

The President of the United States to Fred H. Beach, of Rochester, in the county of Monroe, in the State of New York, Greeting:

You are hereby cited and admonished to be and appear in the United States circuit court of appeals for the first circuit, in the city of Boston, Massachusetts, on the nineteenth day of March next, pursuant to an appeal duly obtained from a decree of the circuit court of the United States for the district of Massachusetts, wherein Clarence W. Hobbs and George A. Craig, and Isaac L. Prouty, as executors of the estate of the late Richard Sugden, deceased, are defendants and appellants, and you are appellee, to show cause, if any there be, why the said decree, entered against the said appellants, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

Witness, the Honorable William L. Putnam, judge of the circuit court of the United States for the district of Massachusetts, this nineteenth day of February, in the year of our Lord one thousand eight hundred and ninety-eight.

WILLIAM L. PUTNAM,
Circuit Judge.

Acknowledgment of Service on Citation on Appeal.

Service of the within citation is hereby acknowledged.

JOHN DANE, JR.,
Counsel for Complainant and Appellee.

Dated New York, February 25, 1898.

Clerk's Certificate.

UNITED STATES OF AMERICA, *Massachusetts District*, } *ss:*

I, Alexander H. Trowbridge, clerk of the circuit court of the United States for the district of Massachusetts, within the first circuit, certify that this volume entitled "Volume I, pleadings and evidence," and one other volume entitled "Volume II,
645 & 646 exhibits," having annexed thereto my certificate of same date as this certificate, contain and are a true copy of the record and all proceedings of said circuit court in the cause in equity entitled,

FRED H. BEACH, Complainant,
v.
CLARENCE W. HOBBS ET AL., Defendants, } No. 256.

now pending in said circuit court, the opinion of the circuit court of August 23, 1897, the complainant's prayer for appeal and assignment of errors, the defendants' prayer for appeal and assignment of errors, and also the original citations issued to Clarence W. Hobbs *et al.*, and to Fred H. Beach, upon the appeal of the complainant and defendants in said cause, with the acknowledgment of service thereon.

In testimony whereof, I hereunto set my hand and affix the seal of said circuit court, at Boston, in said district, this seventeenth day of March, A. D. 1898.

[SEAL.] ALEX. H. TROWBRIDGE, *Clerk.*

647 Circuit Court of the United States, District of Massachusetts.
In Equity.

FRED H. BEACH
v.
CLARENCE W. HOBBS ET AL. } No. 256.

Opinion of the Court.

August 23, 1897.

PUTNAM, *J.*:

The patent involved in this litigation purports to cover an improvement in machines for attaching stays to the corners of boxes. The specification clearly describes the main feature claimed to be covered by the patent, so far as we are concerned with it, as follows:

"It has been customary heretofore in making paper or strawboard boxes to apply a stay or fastening strip over the joints at the corners of the boxes, which strip is pasted down on the outside of the box or is folded over the edge of the box and secured by paste both outside and inside of the corner, and such work, as far as I am

aware, has heretofore been done by hand. My invention relates to a machine for doing this work."

In another part of the specification, the patentee explains that, when the stay is simply placed against the exterior surface of the box corner, and not turned in or over the edge, the device may be simplified; but it is not necessary to explain this in detail.

The claims in issue are 1, 2, 3 and 6, as follows:

"1. The combination, with opposing clamping dies having diverging working faces, of a feeding mechanism constructed to deliver stay strips between said clamping dies, and a pasting mechanism for rendering adhesive the stay strips, said clamping dies
648 being constructsd to co-operate in pressing upon interposed box corners the adhesive stay strips, substantially as described.

2. The combination, with opposing clamping dies having diverging working faces, said clamping dies being arranged to co-operate in pressing adhesive fastening strips upon interposed box corners, a feeding mechanism constructed to feed forward a continuous fastening strip, and a cutter for severing the said continuous strip into stay strips of suitable lengths, substantially as described.

3. The combination, with opposing clamping dies having diverging working faces, said clamping dies being arranged to co-operate in pressing an adhesive fastening strip upon the corner of an interposed box, a feeding mechanism constructed to feed between the dies a continuous fastening strip, a pasting mechanism for applying adhesive substance to the strip, and a cutter for severing the strip into stay strips of suitable lengths, substantially as described.

6. The combination of opposing clamping dies having diverging working faces constructed to co-operate in pressing an adhesive stay strip upon an interposed box corner, one of said clamping dies being constructed to act with an elastic or yielding pressure to enable the dies to operate upon box corners of different thicknesses, substantially as described."

The respondents set up by their own enumeration seventeen specific defences. We have given each of them due consideration. If, however, we should state and fully elaborate each of them the opinion we would pass down would be unbearable; but if we omit reference to any of them it will be because the consideration of those omitted is rendered unnecessary by our conclusions with reference to other defences, or because they have been fully disposed of in the previous litigation which has been brought to our attention.

The patent in issue was thoroughly litigated in a suit commenced in the second circuit against alleged infringers who were other than the respondents in this case, and who are not in privity with them. In the circuit court the judgment was rendered by Judge Coxe on a final hearing on bill, answer and proofs, and an elaborate opinion was filed by him, which will be found in Beach *v.* American Box Machine Company, 63 Fed., 597. The case was also thoroughly discussed on appeal in an opinion drawn by Judge Lacombe, entitled on appeal as Inman Manufacturing Company *v.* Beach, 71 Fed., 420. The same appeal is also reported in Inman *v.* Beach, 35 U. S.

App., 667. In the court of appeals the proceeding is described as an appeal from an interlocutory decree; but by this is intended the usual decree for an injunction and an accounting, rendered after a hearing on bill, answer and proofs, as we have already ex-
649 plained. There were in issue claims 1, 2 and 3, and also some other claims which are not in issue here; but claim 6 was not considered in that litigation.

Under these circumstances, it is necessary, first of all, that we should determine the effect to be given to the legal proceedings in the second circuit. So far as a question of that nature appertains to issues made on applications for preliminary or temporary injunctions, the law is well settled, as stated by the court of appeals for this circuit in Bresnahan *v.* Tripp Giant Leveller Company, 72 Fed., 920, 921, and in the second circuit in New York Filter Company *v.* Niagara Company, 80 Fed., 924, 929. That, however, does not determine the rule applicable to cases on final hearing, where parties respondent are not estopped by the prior litigation, and are entitled to have their rights determined strictly in accordance with the law and the facts as presented by them.

So far as any proposition may be fully presented to the court of appeals in any circuit, and determined by it, resulting in a rule which is and ought to be of general application, especially when it involves Federal questions, a condition of adjudications which would defeat uniformity throughout the United States would clearly disappoint the contemplation of Congress in establishing those tribunals. It certainly was not the expectancy of Congress that the establishment of those courts would destroy the general uniformity of adjudications in the Federal tribunals, touching general principles of law, and especially touching Federal questions, which has heretofore existed; nor was it its purpose to create several centers for the determination of that class of questions, which would take on a local character, as is the fact with reference to the varions State tribunals. As was said by the circuit court of appeals for this circuit, in Beal *v.* City of Somerville, 50 Fed., 647, 652, the circuit courts of appeals must maintain themselves as tribunals of final jurisdiction, notwithstanding the possibility that cases disposed of by them may in some form reach the Supreme Court. In view of this fact, a decision of the circuit court of appeals in any circuit, so long as it remains unappealed from, and so long as the Supreme Court has not issued its writ of certiorari to re-examine it, must be regarded as having more effect than that ordinarily given to even the highest State tribunals, or to any court of merely concurrent jurisdiction, no matter how great its learning. There seems
650 to be no method of maintaining the necessary uniformity of the law with reference to general questions, especially Federal questions, unless the mature and solemn judgments of a circuit court of appeals in any circuit are accepted as authoritative declarations of the law, subject only to such criticisms on the score of oversight or evident mistake as would apply to a judgment of the circuit court of appeals in the particular circuit where the litigation then under determination may be pending. These observations

must, of course, be limited to what was necessarily determined, and they cannot safely be made to include what was not strictly essential to what was thus determined.

These considerations have a special importance as applied to a solemn and well-considered judgment of any circuit court of appeals with reference to a patent for an invention issued by the United States, when the state of the proofs remains substantially the same, in view of the reluctance of the Supreme Court to issue writs of certiorari in causes of this character, involving mainly questions of fact. Otherwise such patents, although intended by statute to have effect throughout the whole country, would, for practical purposes, be territorially limited, and would be of effect only in portions thereof, and practically invalid in other portions. It is also to be borne in mind that there is no serious danger that the courts in any circuit, by following the decisions of the circuit courts of appeals in other circuits, would perpetuate any seeming error, because of the power vested in the Supreme Court to rectify the same by issuing its writs of certiorari. We are, however, not required to definitely determine the effect of these considerations in the case at bar, because, to the extent that the court of appeals for the second circuit has reached necessary conclusions in reference to the patent at issue, they meet our approval so far as they concern the condition of the case as it stands before us.

In Green *v.* City of Lynn, 55 Fed., 516, 518, we had occasion to consider in what way the findings and decisions of any court of authority with reference to a particular patent, on a final hearing on bill, answer and proofs, can be made available on a like final hearing in another court, where the respondents are not the same, and are not conclusively estopped by the prior determination. That new parties litigant are entitled to have their facts carefully scrutinized, with a view of determining whether or not they present a different case from that adjudicated in the
651 prior litigation, is well illustrated by Andrews *v.* Hovey, 123 U. S., 267. In Eames *v.* Andrews, 122 U. S., 40, the Supreme Court considered with exceeding fulness precisely the same patent involved in Andrews *v.* Hovey, and sustained it, giving it a very liberal support. In Andrews *v.* Hovey, however, by reason of a single fact which the court there said, at page 268, was conceded by the brief filed in behalf of the owners of the patent, the court held in favor of a new alleged infringer, who was not estopped by the prior judgment, that the patent was void; and the court confirmed this later determination on an application for a rehearing in Andrews *v.* Hovey, 124 U. S., 694. This result with reference to the patent there litigated is a striking illustration of the necessity of carefully securing to new defendants or respondents all their rights, as shown by the special facts exhibited by them, notwithstanding determinations in prior litigation, to which they were not parties, with reference to the same subject-matter. This principle was stated in Mackay *v.* Easton, 19 Wall., 619, 632, as follows:

"The cases cited under the second objection are not evidence in this case; the records of them are not before us. The reports of

their decision in Howard may be referred to as expositions of law upon the facts there disclosed, but they are not evidence of those facts in other cases." * * * "The general language of the opinion must be construed and limited by the facts of the case."

In Green *v.* City of Lynn, *ubi supra*, we were asked to apply the conclusion of the Supreme Court in Andrews *v.* Hovey, and the same patent was in issue in each case; but, at page 518, we laid down the rules by which courts are to be guided in adapting to a case in hand the conclusions in prior litigation, involving mixed questions of law and fact, as follows:

"Of course the findings of the Supreme Court in Andrews *v.* Hovey on questions of law are conclusive on all other courts. The same is true as to its findings of fact, with reference to any other cause in which the court perceives that the proofs are substantially the same as those which came before the Supreme Court. The reasons for this need not be elaborated; but this distinction is to be noted, that when the parties are not the same in each case, the determinations of issues of fact by the Supreme Court do not operate strictly as *res adjudicata*, or as a technical estoppel, but merely upon the conscience of the inferior tribunal. How are the cases to be brought together for this purpose? An answer based on the fundamental rules of law seems simple. First, it is essential that the facts brought to the attention of the Supreme Court should be proven in the pending cause independently, according to the ordinary rules of evidence; and thereupon the court in the pending cause should advise
652 itself as best it may of what appeared to the Supreme Court, — ordinarily from the opinion rendered by it, and if this is not sufficient in detail, from an informal perusal of whatever was laid before it. As this ascertainment is merely to inform the conscience of the court in the pending cause, and to enable it to follow the line of reasoning and conclusions of the appellate tribunal, there is no occasion for burdening the case with the formal proof of what appeared in the Supreme Court, nor is there any propriety in so doing. Therefore, it was that this court granted the motion of the complainant to strike out the two volumes in question, and held that the defendant, if it sought to avail itself of the reasoning and conclusions in Andrews *v.* Hovey, must prove the substantial matters which there appeared as independent facts according to the usual rules of evidence.

Robinson on Patents, vol. 3. secs. 1017 and 1175, touches this question. This portion of this work must, however, be read with care, because, as is too frequent in discussions of this and kindred questions, sufficient discrimination is not made between the rules touching interlocutory and *ad interim* injunctions, and those pertaining to final hearings. The court conceives, however, that the author correctly states the principle in sec. 1175 as follows: 'The weight to be attached to any judgment in favor of a patent, as evidence of its validity in future actions, depends upon the identity of parties, the identity of issues, the identity of testimony,' and so on. By the words 'the identity of testimony,' the author evidently means that the same facts must be proven in each case independently.

In Edgarton *v.* Furst & Bradley Manufacturing Company, 9 Fed. Rep., 450, the court being asked to apply decisions in several cases to a pending patent cause, said as follows: 'But the proofs in Brown *v.* Whittemore,' meaning one of the other cases, 'on the question of prior use and sale with the consent of the patentee, and in Edgarton *v.* Breck,' meaning also one of the other cases, 'on the question of invalidity, do not seem to have been the same as in the cases now before the court.' * * * 'Of course, if the testimony in these cases was substantially the same as that in the cases heretofore decided by the learned judges in the Massachusetts circuit court, I should feel wholly bound by their decisions and the construction of the patent given by them.' In McCloskey *v.* Hamill, 15 Fed. Rep., 750, the court, touching a like proposition, said: 'The facts which the plaintiff proved upon the second hearing,' meaning a second hearing in a prior cause, 'are the same which he relies upon in this case.' In Celluloid Manufacturing Company *v.* Zylonite Brush and Comb Company, 27 Fed. Rep., 291, the court said, p. 295: 'The facts presented by the record are so strictly similar to those in,' naming a case on the same patent previously heard by another tribunal. In American Bell Telephone Company *v.* Wallace Electric Telephone Company, 37 Fed. Rep., 672, the court spoke of 'the examination of the record,' meaning plainly the record in the then pending case, made to ascertain whether distinguishable from cases theretofore decided." * * *

653 "Therefore, in applying the conclusions of Andrews *v.* Hovey, this court is, first, to inquire what facts are proven in the pending case by independent evidence given under the ordinary rules of law; and, second, to examine the opinions of the Supreme Court and the line of reasoning and conclusions which they exhibit, and from these or otherwise—but not by formal evidence—become satisfied whether or not the proofs of which the latter court took cognizance were substantially the same as those in the case at bar. If they were, its line of reasoning and conclusions bind the conscience of this court upon the questions of fact involved; otherwise they fail to do so, perhaps wholly, perhaps in part.

It is true that this method of proceeding may produce a result on questions of fact differing from the latest findings of the Supreme Court, but in this respect we have the example of that court itself, as shown with reference to this very patent, in Eames *v.* Andrews, 122 U. S., 40, and Andrews *v.* Hovey, already referred to."

Applying all the considerations which we have thus explained to the protection of the rights of the present respondents in every particular, and at the same time giving the conclusions of the circuit court of appeals for the second circuit the weight which, under the circumstances, we feel bound to give to them, whether we should regard ourselves as in any extent conclusively bound by them or not, and adding thereto the fact that those conclusions, so far as they are necessary to the case at bar, receive, after a careful consideration of them and of the facts now before us, our own approval, the result is that we need refer only in the briefest manner to the

more substantial questions raised at bar, and are able to dispose of them without difficulty.

The defence pressed on us most fully and urgently relates to alleged anticipations and the prior state of the art. It appears by the opinion of Judge Coxe in 63 Fed., at page 600, that the respondents in the prior litigation introduced forty-seven patents showing improvements in machines for making boxes, for inserting wire staples, for flanging boiler plates, for sticking labels and revenue stamps, for bending stiffeners for the heels of shoes, and for applying shoe-button fasteners. Lists of these patents will be found in 35 U. S. App., beginning at page 681. Judge Coxe, however, stated that it was conceded by the respondents' expert that none of those patents anticipated, and also that the discussion was narrowed down to the consideration of two or three prior patents with reference to the state of the art. Judge Lacombe, in the circuit court of appeals, having before him all these prior patents, said, however, at
654 page 423: "The patentee indisputably made a machine which did work that theretofore had always been done by hand;" and also at page 424: "Certainly the state of the art exhibits a necessary part of the work of box-making as done by hand with no machine existing in the art to do it. That machine the complainant was the first to supply." These conclusions were essential to the determination of the appeal. He then considered at length, on the same page, a prior machine used for pasting address labels on folded newspapers, which same machine is again pressed on our consideration. It is entirely plain that, having before it the entire state of the art as exhibited to us, with only two or three exceptions to which we will refer, the circuit court of appeals for the second circuit held that the patentee's device was not anticipated, was useful and involved an important invention. In the present case the respondents have introduced two patents, one to Maxfield and one to Terry, which were not before the courts in the second circuit, and which, so far as we can understand, are introduced more for the purpose of disputing the accuracy of the testimony of the complainant's expert than for throwing light on the case itself. The proposition of the respondents seems to be merely that the machines of Maxfield and Terry were useful for putting stay strips in round boxes, without any claim that they operated in any particular as the complainant's machine operates, or, indeed, that they were in any sense automatic. Whatever may be the position of the respondents in this particular, we are satisfied that the Maxfield and Terry devices present in no respect the functions of that now in issue.

The respondents also introduce in evidence a patent granted to one Sawyer for an improvement in label and tag machines, which apparently was not in the New York litigation. This, however, was never adapted to the special art involved in the case before us, is subject to the same considerations which dispose of the machines for pasting address labels, and, on principles over and over again stated, cannot deprive the complainant of the benefit of his invention. Potts *v.* Creager, 155 U. S., 597, 606; National Company *v.* Boston Company, 156 U. S., 502, 515; Packard *v.* Lacing Stud Com-

pany, 70 Fed., 66, 68; Boston and Revere Railway Company v. Bemis Company, 80 Fed., 287, 289; Edmunds' Law of Patents, 2nd ed., 24.

On the questions of anticipation and the state of the art,
655 we therefore follow the conclusions of the circuit court of appeals for the second circuit. As we have observed, that court did not consider claim 6. This, however, is of no importance, because claim 6 contains the pith of the complainant's invention, which was in the adaptation of the clamping dies, and was necessarily involved in the consideration of alleged anticipations and the state of the art in connection with claims 1, 2 and 3. The conclusions on this topic with reference to claims 1, 2 and 3 apply to claim 6.

That court said, 71 Fed., at page 423, that the first three claims are broad ones, covering "every device for affixing stay strips to the outside of box corners, where the operation is performed by the compound action of a feeding mechanism, a cutting mechanism, and a pasting mechanism, in combination with any opposing clamping dies whose faces diverge." We think that this broad statement goes beyond what the case demanded, and must be regarded as a dictum which we are not required to follow. However this may have been, the respondents have brought to our attention certain facts, apparently not brought to the attention of the courts in the prior litigation, which do not permit the broadest construction of the incidental devices for feeding, cutting and pasting. We will refer to these again hereafter; but so far as the general conclusion of the circuit court of appeals for the second circuit is to the effect that the actual invention of the complainant was a valuable one, that it was broad in its character, and that it should receive a liberal support, we follow it.

We are also prepared to follow that court in the conclusions contained in the opinion of Judge Lacombe, found at page 425, adverse to the contention so strongly urged on us, that there was some broadening or expansion of the first three claims while the applications were pending in the Patent Office, impairing the patent as issued. We also say the same as to the conclusions of Judge Lacombe's opinion, found at page 424, adverse to the further propositions, also strenuously urged on us, that the patent now before us is a mere paper one, and that whatever utility apparently attaches to it really belongs to machines constructed according to later devices. With reference to all of these propositions, the facts before us are in all respects the same as in the prior litigation, and each of them received the full consideration of the courts at that time, so that the prior adjudications with reference thereto ought to bind us; and in addition thereto we are satisfied that their conclusions were correct.

656 As we follow the determinations in the prior litigation only with reference to the topics we have already discussed, we will have no occasion to consider the criticisms made by the respondents in reference thereto touching other particulars.

The respondents press the defence that the combinations of claims

1, 2 and 3 constitute non-patentable aggregations, maintaining that each mechanism, that is, the one for pasting, the one for feeding, the one for cutting and the one for pressing, "produces its appropriate effect unchanged by the others." The most practical and useful definition of an aggregation is that found in Hailes *v.* Van Wormer, 20 Wall., 353, 368, as follows:

"It must be conceded that a new combination, if it produces new and useful results, is patentable, though all the constituents of the combination were well known and in common use before the combination was made. But the results must be a product of the combination, and not a mere aggregation of several results each the complete product of one of the combined elements."

Merely to produce an effect is not to produce a result within the meaning of this definition, nor can it be truthfully said that either of the mechanisms referred to produces an "effect unchanged by the others." The feeding mechanism, the cutting mechanism and the pasting mechanism are only steps, each, to be sure, distinguishable and complete steps, towards the result which is accomplished when the pressing has been done, and which is the only result in a practical sense accomplished by the combinations covered by these claims. The patent law necessarily looks only at practical, not at theoretical, definitions and considerations in these particulars, as in all others. It would be hard to conceive of a device for doing automatic work where strips of paper are to be severed into pieces, and each piece separately manipulated, without a proper feeding, cutting and pasting device, if pasting is a part of the entire work. The important case of Morley Sewing-machine Company *v.* Lancaster, 129 U. S., 263, could never have resulted as it did, if the proposition of the respondents in this particular was entitled to approval.

The complainant first applied for his patent June 10, 1885, and it was issued February 24, 1891. He discovered some errors in the drawings which, if literally followed, would clearly have made his device inoperative. He, thereupon, with a promptness which leaves no opportunity for criticism in that particular, on April 9, 1891, applied for a reissue, which he obtained May 26, 1891. The
657 respondents say in substance that, notwithstanding the defects in the drawings, any person ordinarily skilled in the art would not have been misled by them, and that, therefore, the original patent was not in fact inoperative. This suit is brought on the reissue, and the respondents claim that, for the reasons stated, the Commissioner had no authority to grant a reissue, and that it is invalid. This proposition does not seem to have been submitted to the courts in the prior litigation.

Section 4916 of the Revised Statutes provides as follows:

"Whenever any patent is inoperative or invalid, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his own invention or discovery more than he had a right to claim as new, if the error has arisen by inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, the Commissioner shall, on the surrender of such patent and the payment of the duty required by law, cause a new patent for the

same invention, and in accordance with the corrected specification, to be issued to the patentee."

The application of the complainant for the reissue and the oath accompanying it set out every jurisdictional fact required to entitle him to a reissue. They declared that the patent was inoperative by reason of the errors to which we have referred, and also that the errors arose by inadvertence. It is true that, by the letter of the statute, the Commissioner has no jurisdiction to grant a reissue unless the jurisdictional facts exist as required by law; but the allegations made by the applicant with reference to the alleged inoperativeness and the alleged inadvertence raised pure questions of fact, peculiarly fitted to be disposed of by an adjudication of the Commissioner of Patents, and in no way involving any of the class of fundamental questions, affecting the interests of other parties, which the Supreme Court has not hesitated to reinvestigate on questions of reissue notwithstanding the determination of the Patent Office with reference thereto. This precise question came before this court in American Sulphite Pulp Company *v.* Howland Company, 70 Fed., 986, 991, where we said as follows:

"While, according to our opinion, the reissue was not necessary, and the construction and effect of the patent are in all respects the same as though it had not been obtained, yet the application for it claimed inadvertence with regard to the description of the compactness of the material used for lining, and to the directions with reference to its thickness; so that we think that, on the whole, the determination whether the specification needed amendment,
658 and whether a reissue was essential or proper, was so much a matter of doubt, and, therefore, rested so largely with the Commissioner of Patents, that it cannot be properly reviewed by us."

This case came before the court of appeals, 80 Fed. Rep., 395; but the question of reissue was not raised in it. The appellate court, therefore, did not pass on this proposition, and the decision of this court with reference thereto stands as yet unchallenged, and is sufficient to control us in the present case. We may add, however, that in United States *v.* American Bell Telephone Company, 167 U. S., 224, the court, at page 267, reaffirmed the statement that, even in matters of reissues, the Commissioner of Patents exercises quasi-judicial functions. We are not aware of any decision of that court which deprives him of the power of exercising such functions with reference to questions of mere detail, and affecting no substantial right. It would be an unreasonable state of the law which, in a matter of detail of this character, would deprive both the patentee and the public of the benefit of the conclusive effect of a summary proceeding at the Patent Office, and would compel both to await the result of a long litigation before being able to ascertain whether a reissue was effective or otherwise, and whether, on account of it, there existed or not a valid patent which the one was entitled to enforce and the other bound to respect.

There is no substantial question as to the validity of the sixth claim which has not been met by what we have already said with

reference to the other claims. The respondents maintain that this claim came in by amendment in November, 1890, which was after one Horton applied for a patent for his machine, which the respondents say is the alleged infringing machine in the case at bar. The fact is, however, that it must have been apparent on the earliest application filed by the complainant, June 10, 1885, that what now appears as claim 6 was the real pith of his invention. Any person having any skill in the art could not have failed to have discovered this, and to have been warned accordingly of what might develop as the proceedings progressed in the Patent Office. But a conclusive answer to the proposition of the respondents is that on December 8, 1886, a claim was brought in by amendment in all respects the same as claim 6, except that it in terms limited the elasticity to the lower end of the plunger. This was a clear statement of the nature of the complainant's invention as now shown in the sixth
659 claim, and any one fairly conversant with the topic must have seen that his limiting the elasticity by the mere letter to the lower end was a blunder. Further than this, the patent to Horton states as follows:

"This invention relates to that class of machines for applying stays to the corners of boxes and box covers, in which a rectangular mandrel is employed to support the box or cover internally, while a reciprocating plunger having a re-entrant angle in its operating face descends and bends the stay into angular form and presses it upon the corner of the box body or cover while the same is supported by the mandrel. The invention has for its object to provide a simple, efficient, and rapidly-operating machine of this class."

By this statement, Horton and the respondents, who are manufacturing under him, are expressly limited to an improvement on the pith of the device shown in the sixth claim. They made that their point of departure, and by so doing they assumed all hazards, whatever they might be, of the rights of any person to priority with reference to the substance of the sixth claim, whether a patent had been issued, or applied for, or neither.

The respondents contend that one Jaegar obtained a British patent for exactly the same invention as that now in issue, and that this British patent has expired. It is not claimed that this patent was obtained under any authorization from the complainant, direct or indirect, or that Jaegar in fact anticipated him. So far as the record shows, it was obtained in violation of the complainant's rights. Nevertheless, the respondents maintain that, by reason of the mere letter of the closing paragraph of section 4887 of the Revised Statutes, the complainant's patent in the United States expired when this unauthorized patent terminated. Such a construction of the law is too unreasonable to obtain credit in any court, and is easily met by the fact that the whole section is to be taken together; and it is apparent from the first part of it that the whole relates only to patents taken out by patentees under the laws of the United States.

We now have left only the question of infringement. With reference to the sixth claim there is no occasion for any discussion on

this point. The complainant's expert testifies, without contradiction, that the respondents' machine has all the elements contained in this claim, and he enumerates them for the purpose of making his testimony emphatic and unmistakable in this particular. He is plainly right.

There are serious difficulties with reference to the question
660 of the infringement of claims 1, 2 and 3. These depend on their proper construction. As we have seen, the court of appeals for the second circuit expressed the view that they applied to every device for affixing stay strips to the outside of box corners where the operation is performed by the combined action of a feeding mechanism, a cutting mechanism and a pasting mechanism, with any opposing clamp dies whose faces diverge. This permits any forms of feeding mechanism, cutting mechanism or pasting mechanism. But each of the claims closes with the words "substantially as described." The cutting mechanism described in the specification is of so simple a character that possibly almost any device for cutting with sharp edges would be regarded as comprehending its equivalent; but the feeding mechanism therein described is a complicated combination, with minute details evidently intended to accomplish special functions, although the functions are not set out in the patent. The Commissioner of Patents, by his communication of December 26, 1890, required that the words "substantially as described" should be used to limit the word "mechanism," in each claim, wherever the word "mechanism" occurred; but the complainant replied, December 31, 1890, that this was unnecessary, because, as he stated, "it is perfectly clear that the words 'substantially as described,' found at the end of each claim, refer to each and every part mentioned in the claim." These incidental mechanisms were expressly made elements in claims 1, 2, and 3. It is not necessary to go over the question of a limitation by a patentee of the claims of his patent by what occurs in the Patent Office, because this has all been fully covered by the court of appeals for this circuit in Reece Company *v.* Globe Company, 61 Fed., 958; and the proposition is also restated in the opinion passed down August 20, in Hart & Hegeman Company *v.* Anchor Company. But, certainly, what thus appears on the records of the Patent Office must be accepted as the complainant's formal acquiescence of record in the demand of the Patent Office, that the claims should be expressly limited in the way in which the patentee thus solemnly says they were in fact limited. This series of facts does not seem to have been brought to the consideration of the courts in the second circuit: but they have been especially brought to our attention, and we are, therefore, required to give them due effect. In this particular these claims are like those of the patent in Morley Machine Company *v.* Lancaster,
129 U. S., 263, 266, already cited; and yet in that case, at
661 every point where it considered the incidental mechanisms forming a part of the entire machine, as the incidental mechanisms here of feeding, cutting and pasting form parts of this machine, the court at pages 284, 285, 286, 289 and 290, assumed

and impliedly held that the patent covered only known substitutes or equivalents for those incidental matters.

Now, in the case at bar, as we have already said, the feeding mechanism of the combination is expressed to be of a detailed character, apparently having in view special functions. The work to be done by the respondents' machine is much simpler than that which can be accomplished by the complainant's, as it relates wholly to pasting stay strips on the outside of the corners of boxes. Therefore, the strips can be made to approach the dies in the respondents' device at right angles to the line by which they must approach it in the complainant's device, for at least a part of its operations; and, for this and other reasons, the respondents' feeding device might well be much simpler than the complainant's, and have regard to very different functions. In saying this, we bear in mind that the reciprocating plates of the respondents' mechanism, carrying the stay strip, is generally regarded as the equivalent of the complainant's feed-rolls with their intermittent motion; but, notwithstanding this, the respondents' device for feeding seems to omit the complicated details which are parts of the complainant's device, as we have already explained them. The complainant has not deemed it necessary to elaborate his case on this question, and it is possible that we do not fully understand the nature of his combination with reference to the feeding device; but, from the examination we have given it, we feel bound, for the reasons stated, to hold that the combinations in claims 1, 2 and 3 are so limited in this particular that the respondents do not infringe them.

Let the complainant file a draft decree for an injunction and an account with reference to the sixth claim only, such draft decree to be filed on or before the eleventh day of September next, and corrections thereof to be filed on or before the eighteenth day of September next.

662 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

Certificate of Clerk to Volume III, Transcript of Record.

UNITED STATES OF AMERICA, *First Judicial Circuit,* } *ss:*

I, John G. Stetson, clerk of the United States circuit court of appeals for the first circuit, certify that the foregoing printed pages 629 to 661, inclusive, contain and are a true copy of volume III, transcript of record, in a cause pending in the circuit court of the United States for the district of Massachusetts, entitled—

FRED H. BEACH, Complainant,
v.
CLARENCE W. HOBBS ET AL., Defendants,

as said transcript of record was transmitted to the United States circuit court of appeals for the first circuit, as a part of the record of said circuit court, in said cause, upon the appeal of the said complainant from an interlocutory decree of said circuit court in said cause to said United States circuit court of appeals for the first circuit.

662*a* I further certify that this volume III is the volume referred to as volume III in my final certificate bearing even date herewith contained in volume IV of the record and all proceedings in this case, page 683.

Seal United States Circuit Court of Appeals, First Circuit.

In testimony whereof I hereunto set my hand and affix the seal of said United States circuit court of appeals for the first circuit, at Boston, in said first circuit, this twentieth day of July, A. D. 1899.

JOHN G. STETSON, *Clerk.*

663 United States Circuit Court of Appeals for the First Circuit.
October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

CLARENCE W. HOBBS ET AL., Defendants, Appellants,
v.
FRED H. BEACH, Complainant, Appellee. } No. 247.

Appeal from the circuit court for the district of Massachusetts.

Before Colt, Brown, and Lowell, JJ.

Opinion of the Court.

February 13, 1899.

COLT, *J.:*

The subject-matter of this suit is reissued letters patent No. 11167, dated May 26, 1891, granted to Fred H. Beach for an improvement in machines for attaching stays to the corners of boxes. The court below decided that the defendants' machine infringed the sixth claim of the patent, and did not infringe the first, second, and third claims. Hence these cross appeals.

The Beach patent, for the first time in the history of the art, describes a machine for staying the corners of paper boxes
664 with short strips of paper or muslin. Before this invention the work had been done by hand.

The original application was filed June 10, 1885. This application was put in interference with several others. After a contro-

versy of five years in the Patent Office, the several interference proceedings were dissolved, leaving the priority of invention with Beach. The original patent was issued February 24, 1891.

In October, 1890, Inman and Jaeger, two of the parties to the interference proceedings, brought suit in the United States circuit court for the northern district of New York to set aside the patent to Beach and award the invention to Inman. Upon proofs taken and after arguments by counsel the case was dismissed.

A suit for infringement was afterwards brought in the same court by the complainant against The American Box Machine Company and others. The record in that case was voluminous. The prior art was exhaustively investigated, including some fifty prior patents. After full hearing upon bill, answer, and proofs, Judge Coxe in a carefully considered opinion, (63 Fed. Rep., 597) sustained the validity of claims 1, 2, 3, 4, 5 and 7, of the patent, and held that the defendants' machine infringed these claims. On appeal to the circuit court of appeals the case was again fully heard before Judges Wallace, Lacombe, and Shipman, and that court affirmed the decision of Judge Coxe. 16 C. C. A., 165; 71 Fed. Rep., 420.

Subsequently another suit for infringement was brought in the same court by the complainant against the Inman Manufacturing Company and others, and, after hearing, a preliminary injunction was granted. This decision was affirmed by the circuit court of appeals. 24 C. C. A., 408; 75 Fed. Rep., 840.

Although the defendants in this case are not the same or in privity with the defendants in the other cases, we think as
665 a general rule, and especially in patent cases, we should follow the decision of the circuit court of appeals of another circuit upon final hearing with respect to the issues determined, if based upon substantially the same state of facts, unless it should clearly appear that there was manifest error. In discussing this question in the court below Judge Putnam said:

"These considerations have a special importance as applied to a solemn and well-considered judgment of any circuit court of appeals with reference to a patent for an invention issued by the United States, when the state of the proofs remains substantially the same, in view of the reluctance of the Supreme Court to issue writs of certiorari in causes of this character, involving mainly questions of fact. Otherwise such patents, although intended by statute to have effect throughout the whole country, would, for practical purposes, be territorially limited, and would be of effect only in portions thereof, and practically invalid in other portions. It is also to be borne in mind that there is no serious danger that the courts in any circuit, by following the decisions of the circuit court of appeals in other circuits, would perpetuate any seeming error, because of the power vested in the Supreme Court to rectify the same by issuing its writs of certiorari." 82 Fed. Rep., 916, 919.

The circuit court of appeals on final hearing in the American Box Machine case in affirming the decision of Judge Coxe, said:

"The elements of the first claim are the opposing clamping dies, the feeding mechanism, and the pasting mechanism. The second

claim omits the pasting mechanism, and adds the cutting mechanism. The third claim is substantially a combination of all the elements of the first and second.

The first three claims are broad ones, covering the particular combinations referred to without any restriction to the details of mechanical construction, and defendants concede that, if these claims are to be sustained broadly as they are expressed, they are infringed. As to this first set, therefore, the only question is whether in view of the state of the art, Beach was entitled to appropriate as
666 broad a combination as he has set forth in his first three claims, which cover every device for affixing stay strips to the outside of box corners, where the operation is performed by the combined action of a feeding mechanism, a cutting mechanism, and a pasting mechanism, in combination with any opposing clamping dies whose faces diverge.

The circuit court sustained these broad claims, and we concur in this decision. It is hardly necessary to add anything to the elaborate discussion of this part of the case, which will be found in the opinion of the learned judge who heard it in the circuit court. The patentee indisputably made a machine which did work that theretofore was always done by hand. * * *

Certainly the state of the art, exhibits a necessary part of the work of box-making as done by hand with no machine existing in the art to do it. That machine the complainant was the first to supply. Moreover, the evidence leaves no doubt that it did the work it was devised to do. Subsequent improvements have made it do that work better, have made it practicable to apply stay strips to more varieties of boxes than Beach's original machine could readily handle; but that is immaterial when it is shown, as it has been here, that machines made in strict conformity to the patent have been used by manufacturers for years in doing this very work of applying short stay strips, and to the satisfaction of the users.

So far as the record shows, no machine presenting the complete combination of the first three claims existed before Beach's invention, either in this art or any other. The nearest approach to it is the Dennis and Yorke machine, which pastes labels on folded newspapers. That has feed, pasting, and cutting mechanism combined with a vertical reciprocating plunger descending with a flat head on a flat platen, the newspaper being interposed between. This is quite a close approach to the machine of the patent. It is only necessary to change the flat head and the flat platen to clamping dies with diverging faces, and to make the machine stronger in order to enable it to fasten stay strips to box covers. That is shown by the old Dennis and Yorke machine in evidence, which has been thus altered and does such work. If this Dennis and Yorke machine were already in the box-makers' art, if some one prior to Beach had cut away part of its framework, had made its flat platen rigid
667 and increased its power and employed it to affix adhesive labels to the tops or sides of boxes, it might not be invention merely to change the shape of the dies so as to fit into and over box corners and there apply adhesive strips. But no one had done this

the Dennis and Yorke machine was not in this prior art, and when Beach took it from another art, where it was doing different work, and by modification adapted it to efficient use in his own art and thereby gave to his own art the first machine it ever had which could do work necessary to be done, and always theretofore done by hand, he made an invention to the fruits of which he should be entitled."

Upon a state of facts in which the prior art was fully presented the circuit court of appeals for the second circuit sustained, on broad grounds, and as we think rightfully, the validity of the first three claims of the Beach patent. The defendants in this case have introduced several alleged anticipatory patents which were not before the court in the prior litigation, but it is apparent on inspection that they are much more remote from the Beach invention than some of the patents which were before the courts in the New York case and which were commented upon in their opinions. As to the validity of claims 1, 2, and 3, there is no new evidence in this case which should lead the court to reach any different conclusion from that of the court of appeals for the second circuit.

It was contended in the prior litigation that the first three claims had been unlawfully expanded during the long proceedings in the Patent Office. Upon this issue the circuit court of appeals for the second circuit said:

"Nor does the contention of the defendants that there has been some broadening or expansion of the first three claims during the long period of time that the patentee was in interference call for any extended discussion. When Beach first applied for a patent in June, 1885, he described his entire machine, and each of the claims he submitted then covered the devices for turning in the end of the stay strip under the edge of the box. He filed amendments
668 in May, 1886, in which he added to the specification the statement that where the stay is to be simply pasted down over the corners of the box and is not to be turned under, the work can be done by his machine by using the angular form and one plunger with a corresponding angular notch. This was self-evident on the original specification and drawings, and the statement thus added to the specification described no new or enlarged invention. The original drawings and specifications suggest the claims finally made."

We agree with the statement and conclusion of the court on this point.

Upon the question of the validity of the reissue the same court observed:

"No question as to the effect of the reissue was argued in this court; it is unnecessary, therefore, to add anything to the opinion of the circuit court on that point."

The original patent was issued February 24, 1891, and the reissue was granted May 26, 1891, or three months thereafter. The reissue did not seek in any way to enlarge the scope of the original patent or to appropriate other inventions or improvements. It was ob-

tained solely to correct a mistake in the drawings of the original patent. On this point Judge Coxe said in the New York case:

"No authority is cited to sustain the defendants' theory and it is thought that no tribunal will ever take the harsh and narrow view contended for, certainly this court will not be the first to do so. It appears from the original patent assuming it to be properly in evidence, that there was a clear mistake in the drawings. Though this mistake did not render the patent wholly inoperative it was of such a character that a machine constructed in accordance with the drawings would have been inoperative for some purposes which the inventor was entitled to cover by his claims."

Upon this question the court below observed:

"We may add, however, that in United States *v.* American
669 Bell Telephone Company, 167 U. S., 224, the court at page 267, reaffirmed the statement that even in matters of reissues, the Commissioner of Patents exercises quasi-judicial functions. We are not aware of any decision of that court which deprives him of such functions with reference to questions of mere detail, and affecting no substantial right."

If by reason of any inadvertence or mistake in the drawings or specification, a patent is rendered in part inoperative, and the patentee promptly applies for a reissue, and no substantial rights are affected, or fraudulent intent charged, we think the Commissioner has the right under section 4916 of the Revised Statutes to cause a new patent to issue, and that under such circumstances his decision is conclusive. We know of no authority in conflict with this proposition.

Upon the question of infringement we do not understand that the defendants' machine made under the Horton patent differs substantially from the Jaeger machine before the New York courts so far as the appropriation of the Beach invention is concerned. Both structures infringe under the broad construction given to the first three claims of the Beach patent in the prior litigation. The main issue on this point relates to the feed mechanism. In the Beach machine the strip is fed from the side or across the apex of the box support, and in the defendants' machine the strip is fed from the rear in the direction of the apex of the box support; it is a "back-feed" and not a "side-feed" machine. The back feed is shown in the Knowlton machine which was put into interference with Beach, and the Patent Office decided that it was covered by the Beach invention. However this may be it cannot be questioned that the back feed was a known equivalent for the side feed at the date of the Beach patent. It also appears that the machine before the courts in the second circuit, which was held to be an infringement of the Beach patent, had a back feed. Horton, in his patent, under which the defendants manufacture, makes no claim to the feeding mechanism.

670 In the court below the learned judge said:

"We bear in mind that the reciprocating plates of the respondents' mechanism, carrying the stay strip, are generally regarded as the equivalent of the complainants' feed-rolls with their

intermittent motion; but, notwithstanding this, the respondents' device for feeding seems to omit the complicated details which are parts of the complainants' device."

Reference was also made to the fact that in the circuit court the complainant did not elaborate his case on that question, and to the possibility that the court did not fully understand the nature of complainant's combination with reference to the feeding device. It seemed to the learned judge that these details were apparently intended to accomplish special functions not set out in the patent. Upon the presentation of the case made in this court, however, we think that the differences in details are unessential and do not affect the question of mechanical equivalence.

While we give full weight to the recent decision of the Supreme Court in Westinghouse *v.* Boyden Power Brake Co., 170 U. S., 537, and recognize that it is an abuse of the term "equivalent" to employ it to cover every combination of devices in a machine which is used to accomplish the same result, we are of the opinion that the feeding mechanism of the defendants, according to the repeated expressions of the Supreme Court left unqualified by the decision in Westinghouse *v.* Boyden Power Brake Co., and recognized in that case by its citation of Imhaeuser *v.* Buerk, 101 U. S., 647, 656, is a mechanical equivalent for the feeding mechanism of the complainant, since it was well known as a proper substitute for the one described in the complainant's specification at the date of his patent.

Upon a liberal construction of the first three claims of the Beach patent, and recognizing the doctrine of known equivalents as applicable thereto, we hold that the defendants' machine em-
671 bodies the combinations covered by these claims; and we also hold the same to be true of claim 6 in which the combination is limited to the opposing dies constructed and operating as described.

In our opinion neither the words "substantially as described" in the claims, nor the proceedings in the Patent Office in which the patentee acquiesced in the decision that these words must be inserted after the word "mechanism" in the claims, prohibit the patentee from invoking the doctrine of known equivalents with respect to alleged infringers; nor in dealing with a broad invention which represents a distinct advance in the art, do they estop a meritorious inventor from asking the court to apply a more liberal rule as to what constitutes equivalents, than is applicable to a narrow invention which is only an improvement on what was old and well known. "The range of equivalents depends upon the extent and nature of the invention." Miller *v.* Eagle Manufacturing Co., 151 U. S., 186, 207.

The Beach patent for the first time describes a machine in which were organized clamping dies, feeding, pasting and cutting mechanism which automatically attaches stays of paper or like material to the corners of paper boxes. The patent says:

"As far as the main features of my invention are concerned, forms other than those illustrated of the several parts of the machine may be employed without departure from my invention—as, for in-

stance, in place of the particular mechanisms shown for feeding or delivering fastening strips or stay strips to and between the clamping dies, or for applying paste or glue to the said stay strips—other forms of strip feeding and pasting devices may be used in practice with the same general result, as above described."

It would be giving too broad a construction to the Beach patent to hold that it covered every combination of clamping dies, feeding, pasting, and cutting mechanism which accomplished the
672 same result, but it should be held to cover a combination of these elements or their known equivalents at the date of the patent; the patent should not be limited to the particular form of devices described. Winans *v.* Denmead, 15 How., 330; Morley *v.* Lancaster, 129 U. S., 263; Tilghman *v.* Proctor, 102 U. S., 767; Proctor *v.* Bennis, 36 Ch. Div., 740.

The decree of the circuit court is reversed with respect to the first three claims of the patent, and affirmed as to the sixth claim, and the cause is remanded to that court with directions to proceed in conformity with this opinion. Costs in this court are awarded to the complainant, Fred H. Beach.

673 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

CLARENCE W. HOBBS ET AL., Defendants, Appellants,
v.
FRED H. BEACH, Complainant, Appellee. } No. 247.

Appeals from the circuit court of the United States for the district of Massachusetts from interlocutory decree (Putnam, J.), February 19, 1898.

Final Decree.

February 13, 1899.

These causes came on to be heard May 13, 1898, upon the transcript of the record of the circuit court of the United States for the district of Massachusetts, filed March 19, 1898, and were argued by counsel, and thence were continued under advisement to the present term of October, A. D. 1898:

On consideration whereof it is now, to wit, February 13, 1899, here ordered, adjudged, and decreed as follows: The decree of the circuit court is reversed with respect to the first three claims of the patent and affirmed as to the sixth claim, and the cause is remanded to that court with directions to proceed in conformity with
674 this opinion. Costs in this court are awarded to the complainant, Fred H. Beach.

By the court:

JOHN G. STETSON, *Clerk.*

675 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
v.
CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

CLARENCE W. HOBBS ET AL., Defendants, Appellants,
v.
FRED H. BEACH, Complainant, Appellee. } No. 247.

Petition for Rehearing.

(Filed March 4, 1899.)

To the honorable the judges of the United States circuit court of appeals for the first circuit:

Now come Clarence W. Hobbs *et al.*, by their solicitor, and respectfully petition for a rehearing on the following points:

First. The court erred in holding that defendants have infringed claim 1, which is for a specified combination that contains no severing mechanism, and which is a combination that the Beach reissue states to be for the application of separate stay strips; while defendants' machine is adapted only for application of a continuous stay strip from which the stay-pieces are cut, one by one, by a severing mechanism, and therefore does not infringe claim 1.

Second. The court erred in holding that defendants have infringed claim 2, which is for a specified combination that contains no pasting or moistening mechanism, and which is a combination
676 that is operative only when a wet sponge or the like is held manually or laid in the track of the continuous and previously gummed stay strip; while defendants' machine is adapted only for the application of mechanically pasted stays and therefore does not infringe claim 2.

Third. The court erred in not holding that defendants have not infringed either claim 1 or claim 2, for the reason that defendants have not made, used or sold a machine which was capable, practically, of performing the work done by the combination of either claim 1 or claim 2.

Fourth. The court erred in holding that defendants have infringed any of claims 1, 2, 3 and 5, and the ground for this proposition is that there is no proof by any exhibit or deposition in the cause that defendants' feeding mechanism was a known substitute for the feeding mechanism of the Beach patent.

Dated at Boston, February 21st, 1899.

CLARENCE W. HOBBS ET AL.,
By their Solicitor.

I respectfully certify that in my opinion the above-entitled cause was decided under a misapprehension of fact and is proper to be reheard before this honorable court.

EDWARD S. BEACH.

677 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
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CLARENCE W. HOBBS ET AL., Defendants, Appellees. } No. 246.

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Brief in Support of Petition for Rehearing.

In support of points 1, 2 and 3 of the petition for rehearing, it is respectfully submitted:

First. On page 7 of "Brief for Fred H. Beach in reply," it is stated: "It is submitted that the combination set out in the first and second claims are clearly operative and new as combinations. It will appear obvious to any person, whether skilled in the art or not, that the 'strip' may be severed by a cutter in the hand of the operator in various ways; and that in a like manner a wet sponge or other absorbent material may be held or laid in the track or path of the moving gummed 'strip,' or the application to the 'strip' of adhesive matter may be applied in the same manner."

Thus the complainant himself, in order to make out a case supporting the combinations of claims 1 and 2, practically admits,
678 first, that as to claim 1, a cutter in the hand of the attendant operator must be taken as the equivalent of a severing mechanism; and second that a wet sponge held or laid in the path of the moving gummed "strip" must be taken as the equivalent of the pasting mechanism.

Defendants' machine, on the findings of this court, clearly contains the combination of Beach's claim 3; but defendants' machine is clearly incapable (to use an unusual expression) of committing the tort punishable under claim 1, or of committing the tort punishable under claim 2. Defendants' machine does not and cannot apply separate stay strips, as called for by claim 1; and does not and cannot work according to Beach's claim 2, except by a judicial construction of claims 1 and 2, which imports a severing mechanism into the first claim and a pasting mechanism into claim 2.

Such a construction is contrary to:

McCarthy *v.* Lehigh Valley R. R. Co., 160 U. S., 116.
Stearns *v.* Russell, 85 F. R., 224.
Cushman Paper Box Machine Co. *v.* Goddard *et al.*, per Colt, J.

To make out a case of infringement of either claim 1 or claim 2 by defendant, it is necessary to read a severing mechanism into claim 1 and a pasting mechanism into claim 2.

The proposition that a knife or sponge in the hands of the attendant are the equivalents of the Beach severing mechanism and of the Beach pasting mechanism is clearly wrong. The Supreme Court, in Brown *v.* Davis, 116 U. S., 249, says: "The circuit court held that

claim 2 of the reissue was infringed, although in the defendants' machine there is no lever such as the lever H of the patent, and no equivalent or substitute for it. The view taken was that claim 2 was infringed because the defendants use a rod, the end of which is pushed and pulled by the hand of the operator, while in the patent the lever H pulls and pushes the end of the rod. But the lever or its equivalent, as a mechanical instrument, is made an essential element of claim 2, and dispensing with the lever and using instead the human hand is not the use of an equivalent, although in the plaintiff's machine the hand is applied to work the lever."

679 Brown *v.* Davis, and the cases therein cited, are thought to clearly show that the human hand, with or without a tool carried by it, cannot be taken as the legal equivalent of a mechanism.

The fact that defendants' machine contains all the elements of claim 1 is insufficient to support the charge of infringement of that claim, because that claim is specifically limited to the application of separate stay strips, a kind of work which is mechanically impossible in defendants' machine, and, therefore, defendants' elements of claim 1 (and 2 for that matter) are not used as the combination of claim 1 (or claim 2). Moreover, the Commissioner of Patents, on December 26, 1890, required Beach to strike from his amended specification all reference to the use "of a series of separate stay strips previously cut to the proper shape," because that was "matter which does not conform with either the drawings or specifications as they were at the time of filing the application, and must therefore be erased." On the decision of your honors that the Commissioner exercises quasi-judicial functions, it is submitted that the requirement of the Commissioner that Beach erase reference to the application of stay strips previously cut to proper shape was a quasi-judicial and conclusive judgment that his patent was not to be so construed as to cover the application of separate stay pieces. As it is not shown that defendants have ever made a machine adapted for the purpose of applying separate stay pieces, it follows that defendants cannot be held to infringe claim 1 except by importing into claim 1 a severing mechanism; and this is expressly contrary to McCarthy *v.* Lehigh Railroad Comp'y, 160 U. S., 116, where the court say: "We know of no principle of law which would authorize us to read into a claim an element which is not present, for the purpose of making out a case of novelty or infringement."

Unless it appears from the record that defendants' machine is adapted to be used without a pasting mechanism, defendants have not infringed claim 2, and cannot be held to infringe claim 2, except by importing a pasting mechanism into claim 2 in spite of the Supreme Court prohibition in McCarthy *v.* Lehigh Railroad Company.

Secondly. Claims 1, 2 and 3 are distinct combinations, and are quite unlike the familiar instance of a first claim of three

680 elements, and a second claim comprising the same three elements plus a fourth element; and a third claim for a combination of the first four elements plus a fifth element. Claim 1

makes a separate stay-piece machine. Claim 2 makes a stay m
chine, wherein manual pasting is required. Claim 3 makes t
wholly automatic machine which is the only kind of a machi
defendants have made, used, or sold. Claim 1 is a clearly inope
ative combination except for the application of separate stay piece
Claim 2 is for an inoperative combination, unless a sponge or li
is held in the path of a previously gummed strip.

Third. As to claim 3 and the other claims in suit, it is earnest
submitted that defendants' feeding mechanism was not a know
substitute for Beach's; for, first, the question is not whether Know
ton's back feed was a known substitute for Beach's feed, but t
question is whether Horton's, that is, defendants', specific feedi
mechanism was a known substitute. Fig. 6 of Knowlton's pate
page 590 of the record, shows a complicated feeding mechanism,
which the stay strip is troughed to fit the box corner. On the oth
hand, there is not a single patent in the record which shows Ho
ton's feed, the Horton patent alone excepted. The fact that Hort
did not claim his feed does not, it is submitted, raise even a pr
sumption that his specific feed was old. Failure to claim it aba
doned it to the public, and that is all. No witness, it is believe
even tried to show that the Horton feed was known at the date
Beach's invention as a substitute for Beach's feed; and Fowler sho
that it is a new kind of a feed,* and the fact that Horton's pate
issued before Beach's original patent issued, does not, it is submitte
make Horton's feed a known substitute for Beach's feed at the da
of Beach's patent, within the meaning of the decisions.

The court appears to have ignored the fact that Horton's, that i
defendants', specific form of feeding mechanism cannot be subst
tuted in Beach's patent machine for Beach's feed without destroyi
one-half of Beach's reciprocating die. So defendants' feeding mec
anism is incapable of operative use in any structure disclosed i
the Beach patent. In fact, as appears on page 3 of "Brief
681 Fred H. Beach in reply," counsel for complainant, in suppo
of his proposition that defendants' feeding mechanism was
known substitute for Beach's, had to rely on the Van Geasen pate
of July 4th, 1877, No. 192,798. This Van Geasen patent is not i
evidence and never was put in evidence, and is not referred to
any witness in the case or in any of the pleadings, and is no part
the case whatever. An examination of the table of contents of th
record shows that the Van Geasen patent is not an exhibit, and
is believed and confidently asserted that the Van Geasen patent
nowhere alluded to in the record, except in the file-wrapper a
contents of the Knowlton patent. This does not make the pate
either an exhibit or evidence in the case, and it is submitted th
the defendants below are entitled to have this case decided witho
reference to the Van Geasen patent, which was for a label-and-t
machine. (See page 313 of record.)

* Fowler's testimony respecting the feeding mechanism and the fact that
fendants' movable blade is an essential part of defendants' feed is found at
81, 82 of record,—and is not denied in the record.

The court appears to have ignored the fact that defendants' feeding mechanism is an extraordinary mechanical departure from all known feeding mechanisms, in that it is inoperative as a feeding mechanism without the co-operation of the movable member of the severing mechanism which holds the partially severed stay strip from being pulled backwards from over the interposed box corner by the backward movement of the carrying plate and pawl. So striking a departure from all known feeding mechanisms makes defendants' feeding mechanism radically unlike Beach's in construction and mode of operation. It is thought that the court must have overlooked the distinguishing and substantial difference between the two feeds. Knowlton suggests nothing of the kind. Defendants' movable cutter is an essential element of defendants' severing mechanism.

It is therefore most respectfully but strenuously urged that the court erred in its decision and that a rehearing should be granted.

Respectfully submitted by—

EDWARD S. BEACH,
Counsel for Hobbs et al.

682 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

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Order of Court.

June 2, 1899.

Upon consideration of the petition for rehearing filed in these causes March 4, 1899, no judge who concurred in the decree desiring that the petition should be granted or permitted to be argued, the petition is denied.

By the court:

JOHN G. STETSON, *Clerk.*

683 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

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Certificate of Clerk to Volume IV, Proceedings in Circuit Court of Appeals.

UNITED STATES OF AMERICA, *First Judicial Circuit,* } *ss:*

I, John G. Stetson, clerk of the United States circuit court of appeals for the first circuit, certify that volumes I, II, and III, accompanying this volume and entitled, respectively, volume I, pleadings and evidence; volume II, exhibits of letters patent; volume III, transcript of record, each having my certificate of even date herewith, contain and are a true copy of the whole record of the circuit court of the United States for the district of Massachusetts as transmitted to the United States circuit court of appeals for the first circuit upon the appeal of Fred H. Beach, complainant in the cause pending in said circuit court entitled Fred H. Beach, complainant, *v.* Clarence W. Hobbs *et al.*, defendants, in which an interlocutory decree for an injunction and for reference to a master
684 was entered February 19, 1898; and—

I further certify that said volumes I, II, and III contain and are a true copy of the whole record upon which said appeal entitled No. 246, Fred H. Beach, complainant, appellant, *v.* Clarence W. Hobbs *et al.*, defendants, appellees, was heard in said circuit court of appeals, May 13, 1898.

I further certify that this volume, entitled volume IV, proceedings in circuit court of appeals, contains and is a true copy of the proceedings in said cause in said circuit court of appeals subsequently to the filing therein of the record of the said circuit court contained in volumes I, II, and III.

I further certify that said transcript of record of said circuit court, volumes I, II, and III, and said opinion of the said circuit court of appeals (volume IV, page 663), final decree (volume IV, page 673), petition for rehearing (volume IV, page 675), brief in support of petition for rehearing (volume IV, page 677), and order of court denying petition for rehearing (volume IV, page 682), remain on file and of record in said cause in said United States circuit court of appeals, and that said volumes I, II, III, and IV contain and are a true copy of the record and all proceedings in said cause in said United States circuit court of appeals to and including July 20, 1899, and that the issuing of the mandate upon said final decree of February 13, 1899, has been stayed until the further order of court.

Seal United States Circuit Court of Appeals, First Circuit.

In testimony whereof I hereunto set my hand and affix the seal of said United States circuit court of appeals for the first circuit, at Boston, in said first circuit, this twentieth day of July, A. D. 1899.

JOHN G. STETSON, *Clerk.*

685 UNITED STATES OF AMERICA, *ss:*

The President of the United States of America to the honorable the judges of the United States circuit court of appeals for the first circuit, Greeting:

[Seal of the Supreme Court of the United States.]

Being informed that there is now pending before you a suit in which Fred H. Beach is appellant and Clarence W. Hobbs and George A. Craig and Isaac L. Prouty, executors of the estate of Richard Sugden, deceased, are appellees, and Clarence W. Hobbs and George A. Craig and Isaac L. Prouty, executors of the estate of Richard Sugden, deceased, are appellants, and Fred H. Beach is appellee, which suit was removed into the said circuit court of appeals by virtue of an appeal from the circuit court of the United States for the district of Massachusetts, and we, being willing for certain reasons that the said cause and the record and proceedings therein should be certified by the said circuit court of appeals and
686 removed into the Supreme Court of the United States, do hereby command you that you send without delay to the said Supreme Court, as aforesaid, the record and proceedings in said cause, so that the said Supreme Court may act thereon as of right and according to law ought to be done.

Witness the Honorable Melville W. Fuller, Chief Justice of the United States, the 24th day of October, in the year of our Lord one thousand eight hundred and ninety-nine.

JAMES H. McKENNEY,
Clerk of the Supreme Court of the United States.

Return on Writ of Certiorari.

United States Circuit Court of Appeals for the First Circuit.

And now here the judges of the United States circuit court of appeals for the first circuit make return of this writ by annexing hereto and sending herewith a stipulation between counsel for the respective parties in the cause in the Supreme Court of the United States, wherein this writ of certiorari issued, "that the certified copy of the transcript of record now on file in the office of the clerk of the Supreme Court of the United States may be taken as a return to the writ of certiorari granted on the 24th day of October, A. D. 1899, in the matter of Hobbs *et al.*, petitioners, *vs.* Beach, No. 410, October term, 1899."

In testimony whereof I, John G. Stetson, clerk of said United States circuit court of appeals for the first circuit, hereto set my hand and affix the seal of said court, at Boston, in said first circuit, this sixteenth day of November, 1899.

Seal United States Circuit Court of Appeals, First Circuit.

JOHN G. STETSON, *Clerk.*

687 United States Circuit Court of Appeals for the First Circuit, October Term, 1898.

FRED H. BEACH, Complainant, Appellant,
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Stipulation.

It is hereby stipulated by and between counsel for the respective parties to the above-entitled suit that the certified copy of the transcript of record now on file in the office of the clerk of the Supreme Court of the United States may be taken as a return to the writ of certiorari granted on the 24th day of October, A. D. 1899, in the matter of Hobbs *et al.*, petitioners, *vs.* Beach, No. 410, October term, 1899.

Dated October 26th, 1899.

JOHN DANE, JR.,
Counsel for Fred H. Beach, Complainant, Appellant, and Complainant, Appellee.
EDWARD S. BEACH,
Counsel for Clarence W. Hobbs et al., Defendants, Appellees, and Defendants, Appellants.

688 [Endorsed:] File No., 17,524. Supreme Court of the United States. No. 139, October term, 1900. Clarence W. Hobbs *et al. vs.* Fred H. Beach. Writ of certiorari and return of United States circuit court of appeals for the first circuit thereon. Filed Nov. 23, 1899.